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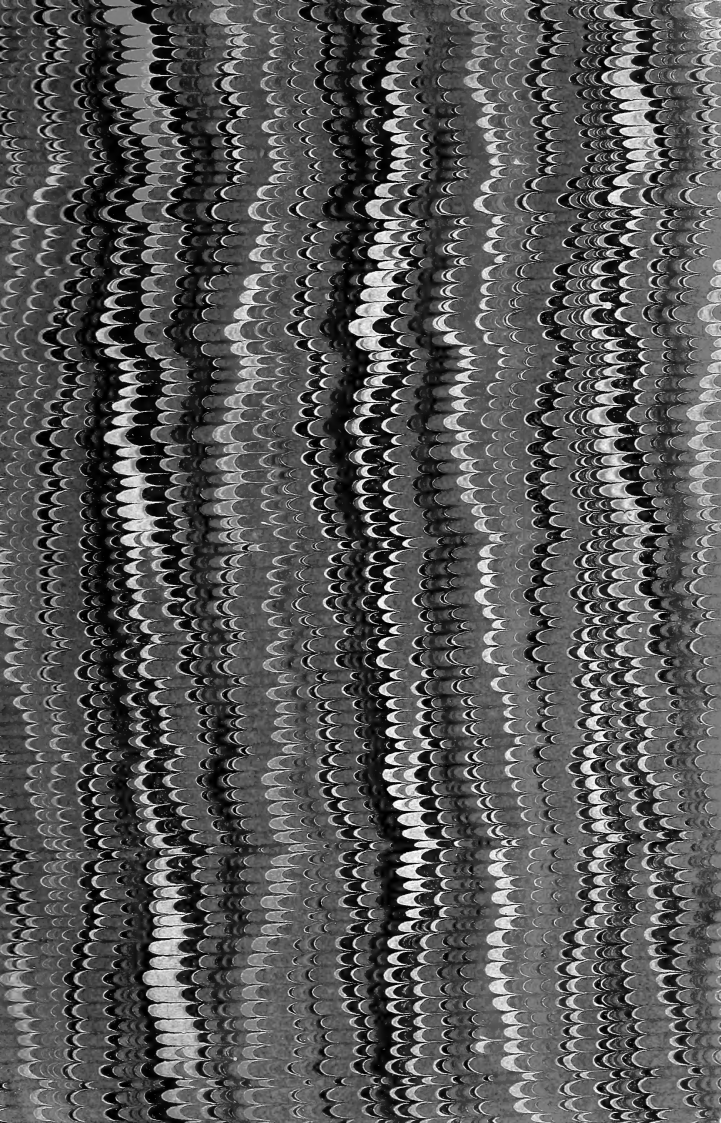
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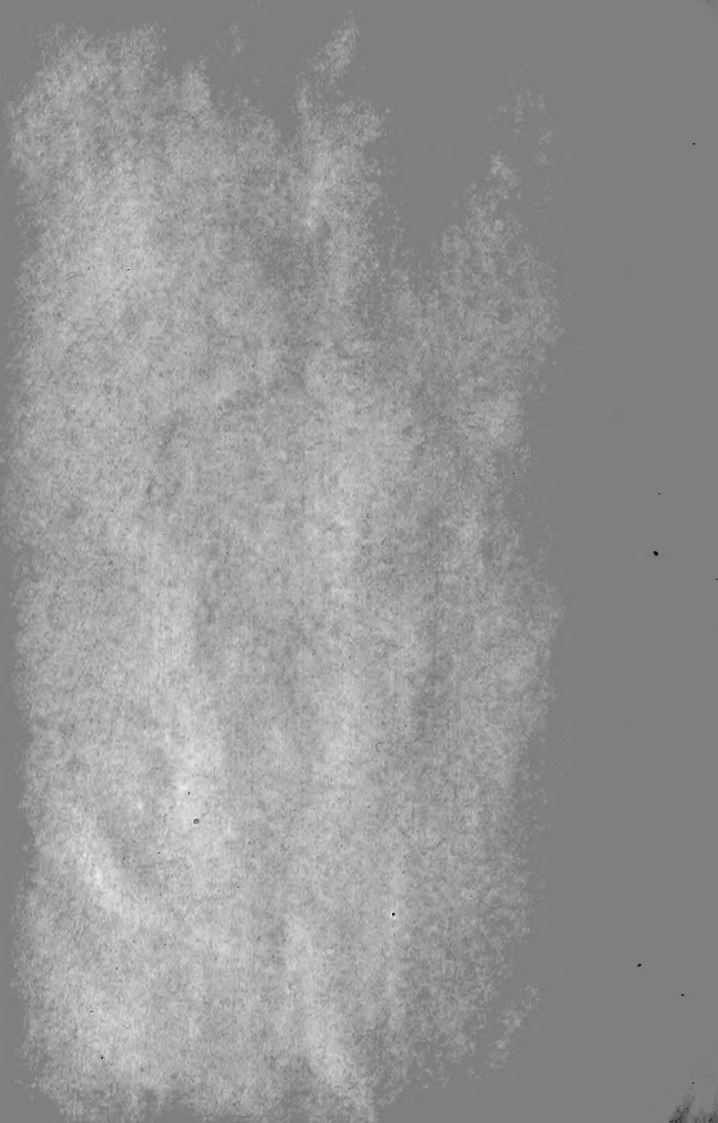
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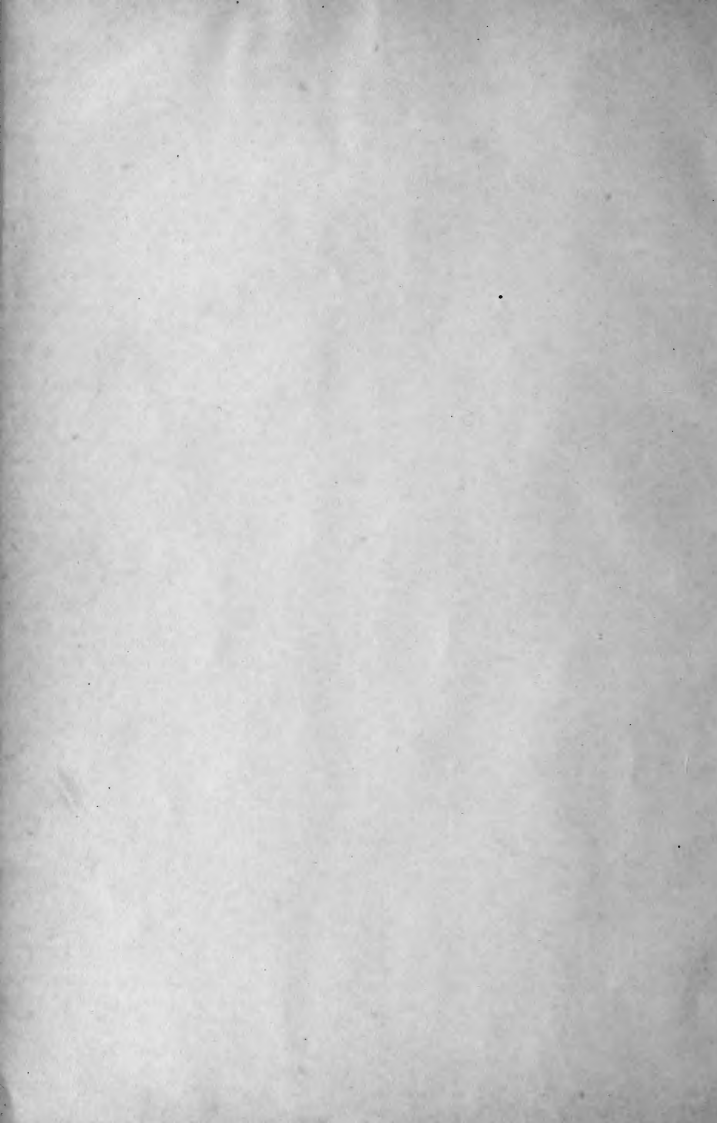
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RELIABLE

POULTRY
MANUAL

PUBLISHED BY THE

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RELIABLE
INCUBATOR
and BROODER
COMPANY

QUINCY, ILL.



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ILLUSTRATED

Reliable Poultry Manual

A COMPLETE
TREATISE ON POULTRY CULTURE

INCLUDING

Poultry Farming, Poultry Buildings, High-Class
Poultry, Diseases, Caponizing, Poultry
for Pleasure, Profits in Ducks,
Geese and Turkeys.

ARTIFICIAL HATCHING A SPECIAL FEATURE

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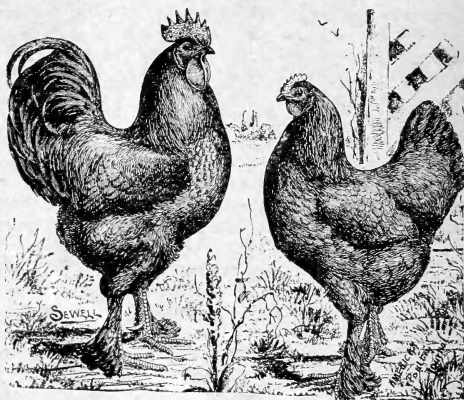
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A PAIR OF BLACK LANGSHANS.

Introduction.

GOD HAS given to all men the means of sustaining their existence and that of their families. To some he has given the mind, which is always grasping after new ideas, and to others ease, luxury and the faculty necessary for amassing colossal fortunes. But the greater of these, in truth, are those who by application and industry have devised means for alleviating the ills of life or of augmenting its productions. It is by the smallest and most insignificant means that many persons reach both fortune and position.

The raising of poultry is one of the simple things that has never received from the public the attention it deserves. The low price of grain and other agricultural products, especially beef and pork, has made farming undesirable, and a number of our best farmers are turning their attention to poultry raising for profit. Nearly every branch of trade is overstocked with workmen. Bookkeeping, clerking and the other higher industries are paying small salaries; and even if there was room for all to follow these occupations, how many are able to save anything over actual expenses? The business of poultry culture opens a promising field for all who possess industry, ambition and a little capital to commence with. The cost of raising chickens and ducks is very small compared with the high prices they always command through the early spring season, during a period that other vocations are comparatively idle.

If you, kind reader, are one among the many who are dissatisfied with your present occupation and your earnings therein, we respectfully ask you to personally investigate the subject of "Poultry Raising for Profit."

Yours fraternally,

Reliable Incubator and Brooder Co.

Quincy, Illinois.

Our Orphans.

A HUNDRED little chicks or more,
Downy, soft and yellow,
Were peeping out their discontent
In voices far from mellow.
I looked about in wonderment;
No mothers were at hand,
To gather 'neath their outstretched wings
The doleful little band.

And as I gazed, a small wee voice
From one chick seemed to say:
"Perhaps you think we like it,
This fine, new-fangled way:
But it's very disagreeable,
For, strange as it may seem,
We never had a mother—
They hatched us out by steam."

"And they call us 'Happy Orphans,'
When we're ready all to weep
For no answering cluck comes back to us,
Though we peep, and peep, and peep.
They say it's scientific,
And I've no doubt it is true,
But I would rather have a mother;
Now, really, wouldn't you?"

A Chapter on Poultry.

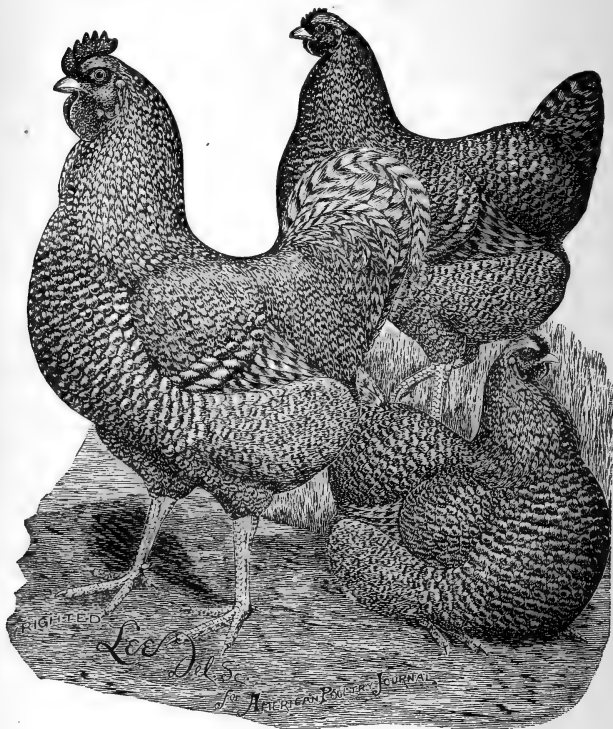
Plymouth Rocks.

WITHOUT a doubt the most popular fowl with the American farmer is the Plymouth Rock. They have been tested for the past twenty years with all the leading varieties and have been found one of the best all-purpose fowls in existence. With good care at eight weeks old they make a plump two-pound broiler, with yellow legs and skin. The pullets begin to lay at about six months old and are very prolific layers during the winter months when eggs command the highest prices. As mothers they really have no superior. They are vigorous, contented in confinement and profitable. Their familiar plumage is like a rich but plainly made garment—always and everywhere admired. Matured cocks of this variety weigh ten to eleven pounds; hens seven to nine pounds. This breed was originated some twenty-five years ago in Southern New England, and they have increased in popularity from the very start and earned their good reputation on their practical merits. They were produced by crossing the Black Java and American Dominique, taking their color from the latter variety. They make one of the most attractive fowls on the lawn and in the yard and are greatly admired by nearly every breeder of fancy poultry.

White Plymouth Rocks

Are identical in size and symmetry as their colored cousins. We do not go crazy over every new breed of fowls—no, nor any new breed, and have often expressed the opinion that we had breeds enough. That decision is adhered to, but if a really desirable new breed is found, and one less desirable is dropped, the number of breeds is not increased. The standard may retain all the old breeds and the new, but if the public drops several of them, that is the condition we allude to.

The White Plymouth Rock is certainly a desirable fowl, possessing all the excellent economic properties of old Barred P. R's, and being pure white is more beautiful, especially on



A TRIO OF PLYMOUTH ROCKS.

a favorable soil, and far more easily bred to a uniformity in color than any parti-colored fowl. Everybody knows the difficulty — nay, the impossibility, of uniformity in a flock

of Barred P. R.'s, for there is an inherent difference in color of males and females, and a multitude of differences in the distribution of the various shades of black and white, which can only be brought to an approximate uniformity by great care and careful selection of a very few from among very many. The Whites are not liable to this objection, and they are equally exempt from the objections urged against any other breed of white chickens; they are larger than the White Leghorns, more active than the White Cochins, and in many particulars surpass any white breed for general purposes. We can see no good reason why White Plymouth Rocks should not be the most popular of all white fowls, and as much sought after as any breed, regardless of color. They are well adapted to the use of farmers who raise, rather than breed chickens, and who have neither the skill nor the time to devote to the work of "breeding to feather." As a market fowl they will be especially attractive if raised on sandy soil or grass runs, so that their clean white plumage will not be marred. The White Plymouth Rock is to-day a popular fowl wherever it is known. Their eggs are larger and darker than the Barred Plymouth Rocks and are sure of one of the biggest booms enjoyed by any solid colored breed.

Light Brahmas.

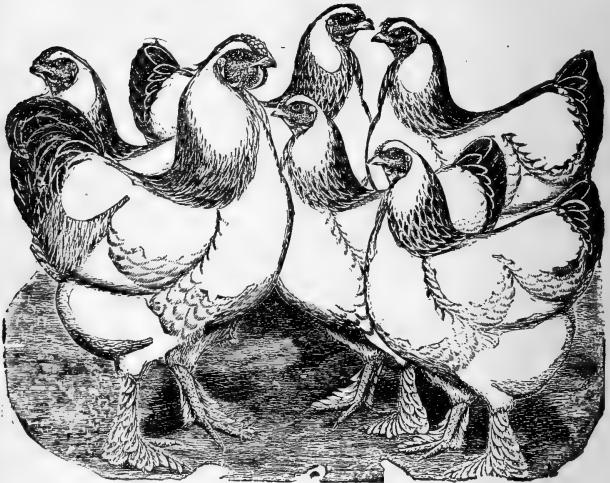
The Asiatics consist of three distinct breeds, comprising the Brahmas, Cochins and Langshans, each of which is subdivided into families, in respect to color markings and form. All of the Asiatics are very large and have feathers on their legs and toes, but differ mainly in shape and comb.

Our oldest breeders will remember the first introduction of the old Cochin China fowls, about the year 1847: first sent to the Queen of England by the British ambassador from Shanghai. Prices were very high for several years, and the craze for the new breed seemed to increase as it spread. One hundred dollars for one fowl was not considered out of the way. The Asiatics all come under one head, the Cochin Chinas, and a few years later the Shanghais. Soon after fanciers, seeing their crude state, commenced to draw out their distinct characteristics and classify them.

They soon developed the Light and Dark Brahmas, Buff Partridge, White and Black Cochins.

The Black Langshans were of a later importation. All of these families have their special admirers, but the Light Brahmas are the most popular and best known. They are very majestic in their carriage and command admiration of all who see them. The accompanying cut well represents a group of Light Brahmas.

The predominating color is white. Black forms part of the plumage of the wings, which is not shown when folded. The tail is black, with a narrow lacing of white around the edge



GROUP OF LIGHT BRAHMAS.

of the large feathers. The feathers of the hackle are white with a black stripe in the center. The comb is what is known as "pea," looking much like two small single combs pressed into one. The legs are heavily feathered to the extremity of the outer toe. The fowls are very docile, and carefully handled will be tame. They should never be wild, and when they are they have been roughly handled. They lay a dark buff colored egg, very rich, but will not lay as

many as our smaller varieties. Neither will they bear confinement of a city lot as well; especially is this the case after the first year. They put on fat, and want to sit after the first year, so as to be quite annoying; but when they have full range of the yard, can roam and pick grass, they are much less disposed to sit and give better satisfaction. They are not well adapted to keeping in large numbers, as are the Leghorns, Minorcas or Wyandottes. For the table they are unexcelled. They grow very fast. The flesh is tender and sweet. They are hardy chicks; once from the shell will live where many others droop and die.

The standard weight of Light Brahmas is, for cock 12 pounds, hen $9\frac{1}{2}$ pounds, cockerel 10 pounds, pullet 8 pounds.

The Silver Laced Wyandotte.

This breed of fowls is all American. American in its conception, American in its get up and American in name. It is a fowl which fills the American eye, which means business and money. The old Dorking is too English for popularity on this side of the water. There is too much fuss and feathers and not enough business, and it is rejected with others of like cut. By his selecting and combining, the American has a fowl made on his order which just suits him. That fowl is the Wyandotte. The Dark Brahma was a large, hardy and fine table fowl, but had too much sit in it and was too clumsy. The American wanted the first three qualities, but had no use for the last two. The Silver Spangled Hamburgs were great layers and very handsome, but small and tender. He had use for the first two qualities, which, added to the first three qualities of the Dark Brahmas, would just suit him. He crosses them, throws out what he does not want, and selects a finely laced, clean yellow-legged, good sized fowl, as his ideal, and by selections, year after year, has produced a fowl that we are all proud of.

This product of Yankee invention, with the assistance of nature, retains the rose comb of the Hamburg, but falling in the rear instead of turning up.

The fowl in weight is about half way between the Hamburg and Dark Brahma. In color it is black and white, laced, the black predominating, black tail, yellow legs, free from feathers. The body is very plump, skin yellow and makes a fine appearance in the market.

They are hardy; give them any kind of a chance and they are not going to be left.

For a few around the house lot, they can not be excelled. They are handsome, easily handled, will lay at all seasons, except during moulting, will sit, but are not annoying in this respect.

They have a very quiet disposition, and put up with the necessities and inconveniences of life without any fuss.



GROUP OF SILVER LACED WYANDOTTES.

The Wyandotte and the Plymouth Rock are generally selected for the broiler farm, when it is desired to produce large numbers and turn them off young.

We are often asked the question, "What do you consider the best fowl for all purposes?" If a main object is flesh with birds for early market (broilers), also a large heavy fowl and a good mother, we would say the Wyandotte. See what we have to say under the heading of "Leghorns." An

off-shoot of the Silver is the White Wyandottes. They are the same except they are solid white. They come from Silver Wyandottes as sports.

A standard weight of all Wyandottes is, cock $8\frac{1}{2}$ pounds, hen $7\frac{1}{2}$ pounds, cockerel $6\frac{1}{2}$ pounds, pullets $5\frac{1}{2}$ pounds. Both varieties lay a medium size dark buff egg—in this respect holding to the Brahma characteristics.

The Langshans.

The Langshans are fine, useful and profitable fowls, and are justly very popular, as they bring their own certificate, and speak for themselves in every yard where they appear, and can stand wholly on their own merits wherever they are known. They are active, agile and impetuous, are very prolific, and grow quickly, mature early and lay well. Although not given to being broody, they are *good setters* and *good mothers*. Their flesh is white, and they have a very thin, white skin. As a table fowl, are equal to small turkeys, and not inferior to them in delicacy and flavor. Their plumage is of a uniform glossy black and full of luster; comb single and a bright red color. The beak is dark, with flesh-colored variations along the line of the mouth. Eyes dark, with but little difference in shape of pupil and iris; neck long, full and profusely feathered; back short and fairly broad; rump high; tail very full and flowing, carried rather high and forward, and furnished with good sized sickles; legs and toes dark, with a vivid pink color showing between the scales; shanks scantily feathered to the end of the outer toes (there should be no feathers on the middle toes); bottoms of the feet are pink. (Pair Black Langshans shown on frontispiece.)

Their eggs are fair size and are beautiful in color, varying from the palest salmon to the darkest chestnut brown. On some there is a bloom like that on freshly gathered fruit, whilst others are spotted. Cocks weigh 10 pounds, hens 8 pounds at maturity.

The Leghorns.

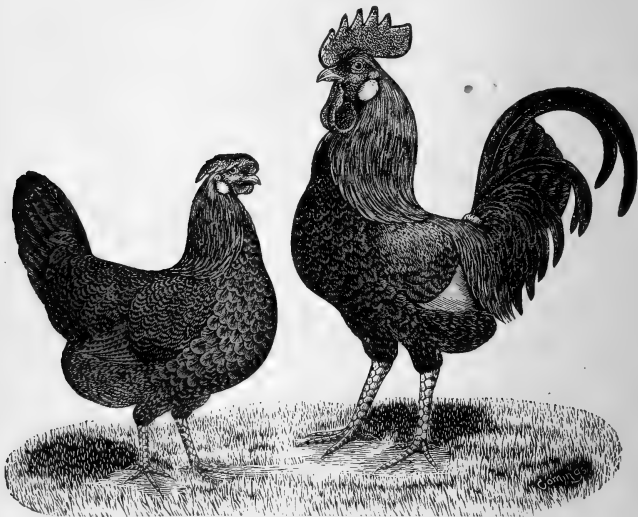
"Which is the best general purpose fowl for flesh and eggs, all things considered?"

A person might as well ask, which do you consider the best general purpose apple? All will depend on where the tree

is to stand, what it is wanted for, early, late, sweet, sour, for baking, stewing, drying or keeping for fall, winter or spring use.

So with fowls. The Wyandotte would be best for a broiler, farm or for market mainly, but if eggs are wanted principally, we would give that honor to one of the Leghorn class.

It is probably the best fowl for the general keeper of poultry.



A PAIR OF SINGLE COMB BROWN LEGHORNS.

It is necessary to confine fowls more or less. The Leghorns take to this restraint more naturally than most others. They are less restless under it, and the little inconvenience does not seem to interfere much with their business, which is to produce eggs.

They go right ahead just the same, but if a range can be given them they will do better. They accept the general idea

of the country into which they have been adopted, that the main end and object of life is business, and that it is best to accept of it kindly.

They are naturally what is called wild, but as we understand that, we must move about among them slowly, not making any quick moves, and by this careful, general handling from the shell, they will climb all over us as freely as any fowl; while at the same time if any sudden moves are made they will fly, which is quite annoying. But as we understand this peculiarity we act accordingly. So that for a small home lot the Leghorns come as near to what we may call the best as any that can be chosen, and for a large number with unlimited range, we would say the same. They will probably lay more eggs to the number and eat less than any other breed.

The Brown Leghorns

Have the same general characteristics. In color, the head, back and exposed part of the wings of the cock are a bright bay, while the breast, flight feathers of the wings and tail, are black. The neck hackle and saddle is bay laced with black. There must no white appear in any part of the plumage.

The hen is of a salmon brown, formed by the alternate lacing of light and dark brown. The neck hackle is laced.

There are four families of Leghorns, the White, Brown, Dominique and Black. The last named is not desirable because it is small and has dark legs. Of the White and Brown Leghorns there are the rose and single combs, no perceptible difference otherwise.

The White Leghorns

Have a solid white plumage, white ear lobe and yellow legs with flowing tail. They lay at all seasons, if well cared for, excepting during moulting, a white egg, and seldom want to sit.

The chicks are hardy and grow fast. Some prefer them for early broilers. They say they early get the size of $1\frac{1}{2}$ or 2 pounds, and at that age are as good as the chicks of the larger breeds. They get their growth at the age of five months, and are good fall and winter layers, as we have said, if well handled.

Poultry and Brood Houses.

Some Practical Suggestions.

WITH the assistance of several of our most successful poultry breeders we are able to present to our patrons illustrations and descriptions of twelve different styles of poultry buildings.

We have kept in mind the fact that all poultrymen, especially many who are just entering into this pleasant vocation, do not possess the means to invest largely in this direction, and have arranged the cost of construction from \$20 to \$100 dollars. However, the cost and quality of material used will govern in this respect. Prices will depend, to some extent, on locality. Our special desire is to make each design plain to those who may desire to build or re-construct their poultry buildings. From the accompanying illustrations the reader can derive ideas that will enable him to construct any one of the houses that he may decide upon as best suited to his needs and pocketbook.

The poultry house illustrated on the next page is one in which convenience and comfort are the prime considerations. The roosting and laying house, which constitutes the main building, is 10 x 20 feet shown in rear side view at Fig. 1 in illustration. The front of the building is eight feet high, with space of two feet between ground run (H) and board floor above same; as seen in Fig. 2 of the illustration, the height of roof above the floor is therefore six feet. The rear posts of the building at point of junction with the shed are five feet high. The shed adjoining the rear of the main structure is 16 x 20 feet, making with the space beneath floor in main building a ground run of 20 x 26 feet.

At B is the passageway, two feet wide, extending the full width of the building, with door shown at C, entering the hen-nery proper. The outer entrance door is seen at A. The roosting perches are shown at E, drop doards at F, nests at

G and located under the drop boards. In the partition back of the nests is a hinged board one foot wide, through which opening eggs are taken from the nests. At 7 is shown a trap door through floor to ground run.

The window in the shed roof is 3 x 3 feet and hinged to afford ventilation in summer. At S S in both figures are shown openings for ventilation four inches in diameter. The board floor in Fig. 2, as before stated, is two feet above

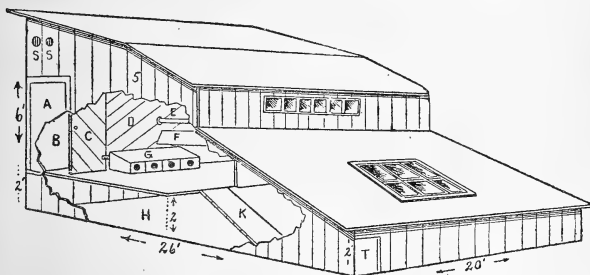


FIG. 1.

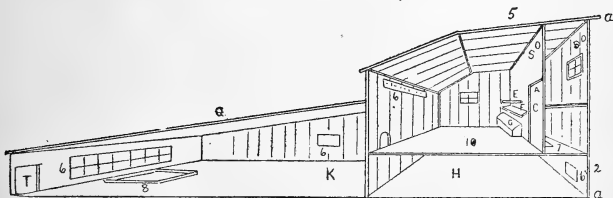


FIG. 2.

ground and can be covered with tar paper on which several thicknesses of newspapers are first laid, and on top of these another layer of tarred felt is tacked on with laths two feet apart. This floor should be kept covered with sand or dry dirt about three inches deep. Coal ashes may also be used on it to good advantage. Over the roosting drop boards tarred felt is also put and this is kept covered with ashes.

The inside walls of the house are sheathed with slate paper, over which is tacked a dozen layers or so of newspapers and then another layer of slate or tarred paper. This house is water and wind proof, and so warm in winter that a pan of water will scarcely freeze over in it.

COST OF MATERIAL.

| | |
|--|---------|
| 1,260 ft. matched boards, 100 2x2 in. scantling, 70 2x4 joists | \$22.80 |
| 2 windows for covered run | 1.75 |
| 5 small windows | 1.20 |
| 15 lbs. nails, hardware, etc | 2.25 |
| Lath | .90 |
| 5 squares roofing paper | 5.00 |
| 3 squares tarred felt for floor | 3.00 |
| 8 squares sheathing paper | 1.00 |
| Total cost | \$37.40 |

A \$32 Poultry Building.

A plain structure is that shown on the following page, but one that answers a good purpose for 25 or 30 fowls. It shows plans for two pens only, but these can be duplicated on same plan to the extent desired.

The building shown at Figure 1 is 10x16 feet, and 9 feet high in front and 5 feet in rear. It is sided up and down with common matched boards. Tar paper is used as sheathing and the floor being double, the paper is also used between floor boards. The roof is covered with No. 1 shingles. Some may prefer ground floor, and if so the cost will be still less.

COST OF MATERIAL.

| | |
|---|---------|
| 400 ft. common boards | \$ 4.00 |
| 220 ft. for flooring | 1.75 |
| 400 ft. common boards for lining | 3.20 |
| 200 ft. spruce or hemlock | 1.80 |
| 2 squares No. 1 shingles | 4.00 |
| Tar paper | 2.10 |
| 200 ft. 2x4s, 10 ft. long | 2.00 |
| 22 ft. 2x4s, 19 feet long, for plates | .22 |
| 96 ft. 4x6s, 16 ft. long, for sills | .96 |
| 90 ft. 6x8s, 10 ft. long, mud sills | .90 |

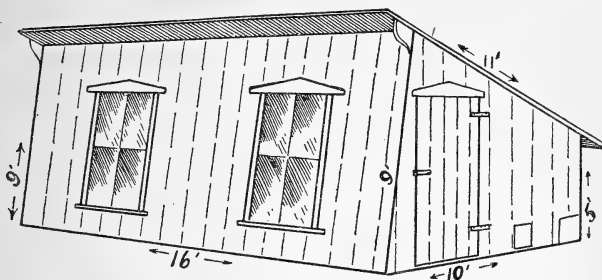


FIG. 1.

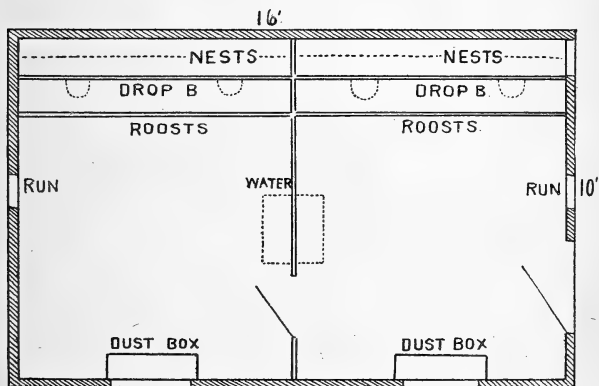


FIG. 2.

A \$32 Poultry Building.

Plans and Specifications by D. L. SOMERVILLE, Stewarttown, Ont.

| | |
|--|---------|
| 64 ft. 2x4s, 12 ft. long, for rafters | 64 |
| 60 ft. common lumber for drop boards, nests, etc . . . | 48 |
| Lath for partitions | 60 |
| Hardware | 1.80 |
| Windows | 2.40 |
| Labor of carpenter | 5.00 |
| Total cost | \$31.85 |

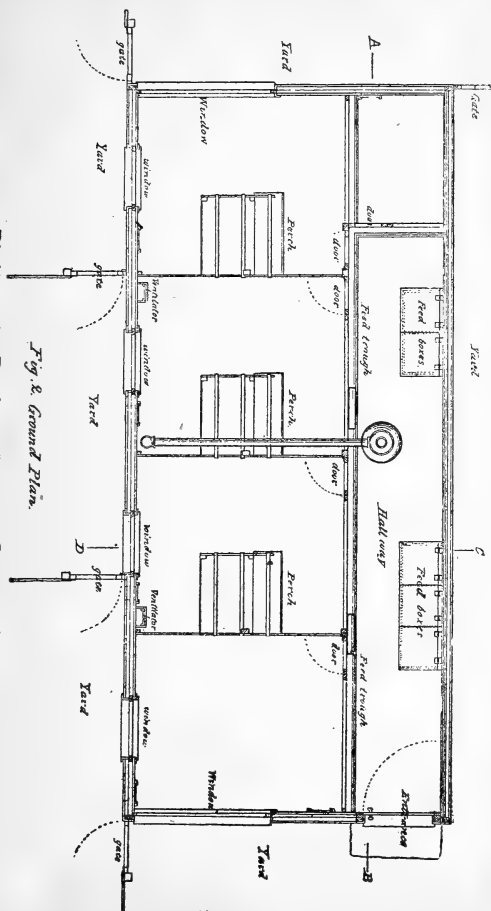
The cost of lumber is figured at \$10 per M for the best grade; \$8 for second; \$9 for Hemlock, and \$10 for scantling, etc.

Blythecote Poultry House.

These buildings are located on the farm of J. D. Tompkins, Brainard, N. Y., and are models of comfort and convenience. In size the structure is about 14x32 ft., divided into compartments 8x10 ft., with a hallway in rear of pens four feet wide. The figure of the ground plan on next page gives detailed information in itself. The partition along the hall is made of wire netting down to within 16 inches of the floor and below this are small rounds two and a half inches apart, through which the fowls feed and drink from a trough and dishes placed on hallway floor close to the partition. The pen partitions are of wire also, down to within three feet of floor, then they are boarded up tight.

Ventilators, one for each pen, are provided in the shape of a chimney made of boards running from the floor up through and above the roof, with an opening at the floor to ventilate in winter by drawing out the cooler air which lies near the floor, also with an opening in the ventilators near the top of the room for use in the summer to take out the hot air near the ceiling, one to be closed when the other is open, according to the season or as occasion requires, each being operated by a cord from the hall.

The perches are arranged about three feet from the floor above a platform and on a level with each other. About one-third of the floor of this platform is something like sixteen inches above the floor of the building and then turned up at an angle of 45 degrees, making it an easy task to remove the droppings, which is done once each week, to an open shed provided with a bin for the purpose. Under the platform at the low side is arranged movable nest boxes, while under the



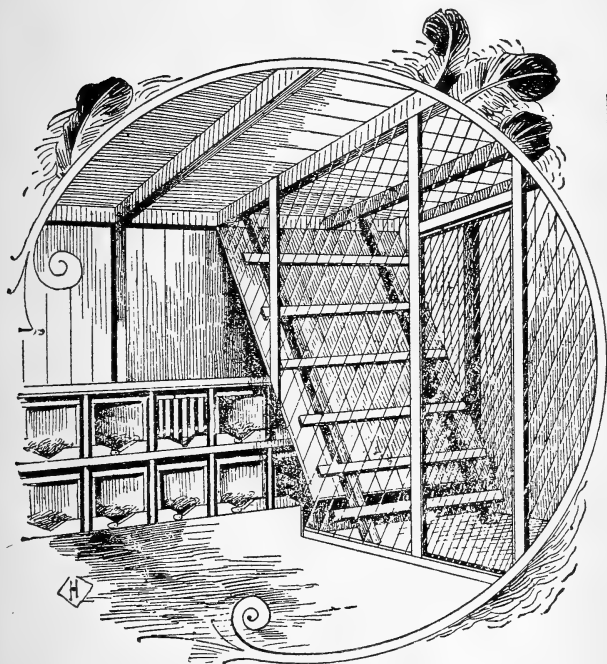
Blythecote Poultry House—Ground Plan.

inclined part of a dust box is made, in which the fowls enjoy the great luxury of a dust bath in winter, located in front of a window that comes to the floor. The floor of the apartments occupied by the fowls is covered with fine gravel and sand to the depth of two or three inches. The feeding and watering being done from the hallway, with only wire netting for partitions, the birds may be seen and cared for with neatness, pleasure and dispatch, while nothing is wasted or made unwholesome by getting into their dishes.

A Novel Poultry House.

The interior arrangement of house on page 13 is original, and for cleanliness it is unsurpassed. It is divided into two rooms, 8x10 and 4x10 feet, respectively, with a wire partition and a wire door to pass from one room to the other. The small room is nearest to the entrance, and is used as the roosting room. The roosts are on the incline plan, and each roost bar is four feet long, and six in number, with a drop board on the same incline one foot beneath, which is covered with dry dirt and carries all droppings down towards the floor and is easily cleaned. By this plan all the droppings are in one place and easy of access, because the roosts are all movable. Everything should be made movable, as far as possible, which renders cleaning handy and does not allow vermin to accumulate in the joints. The nesting room should be as trim and neat as possible. By having it so enhances the pleasures as well as the profits of poultry keeping.

The arrangement of the nests is in single and double rows, and movable, according to the number of hens kept. Each nest is 15x16 inches square and 15 inches high. Take two boards, 15 inches and 16 inches, and place a five-inch strip on front and back at the bottom, with the front cut in V-shape. The supports on top are four 3x½ inch strips, the front one projecting one inch, so as to form a stay for the lattice, which fits under at top and fastens at bottom with a button. The doors are only used when the hen sits, and will prove invaluable to keep the hens from laying in the nest. There is no bottom made to the nest, and it is placed on the dirt with the straw over it. The idea is to have a nest that can be easily cleaned. When there are bottoms in them the vermin accumulates in the crevices, and it seems almost im-



A Novel Poultry House.

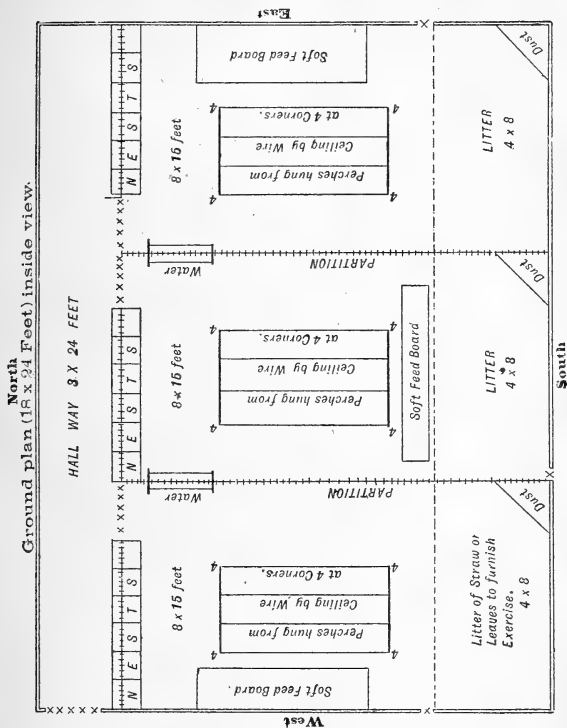
Description and Illustration Furnished by THE AMERICAN FARMER,
Washington, D. C.

possible to thoroughly clean them. By this arrangement we believe that these difficulties are overcome, and with very little trouble the nests can be handled and whitewashed. The dirt bottom is a drawback to lice, and is easier to the hen than boards. This makes a roomy nest and allows space and ventilation to the hen when she is sitting, and the first chick will have the necessary room until the hatch is over.

The door in the wire partition should be closed before the fowls go to roost. This will prevent any from roosting on the nests and forces them on the roosts. The feed bins are over the nests and easy of access, and will hold a bushel of grain, and are six in number.

Sunnyside Poultry House—Cost \$35. -

The cut on opposite page shows ground plan with dimensions of a poultry house with three apartments for three distinct breeds. The size of main building is 18x24, with one door entering into a hall-way which runs full length of building and is three feet wide, giving ample room to run a wheelbarrow in to clean out the various compartments. Also a drop door is left on the nests, the back part of which extends three inches into the hall and allows you to remove eggs or examine nests without entering into the compartment where the fowls are. The nests are to be made portable, so as to be easily taken out and cleaned when desired, giving them a thorough renovation at will. The roosts are suspended near the center of each pen by wires at the four corners with a hook, making them portable and very easily taken out and renovated. A dusting place is shown on diagram in right hand corner of each pen, where the sun will keep it dry, being right under the large windows, the size of it is 2x2x3, being three-cornered. The dotted lines running lengthwise of the building represent a six-inch board stood on edge on ground, forming a litter or scratching apartment 4x8 feet. Soft-feed boards are shown on diagrams in each pen, which are made 2x6 and lathed 18 inches high, roof shape, all around, leaving lath wide enough so that the fowls can get their heads through to eat comfortably. This prevents them from trampling the feed and spoiling it; this is made portable and easy to clean. The doors to the various entrances are shown in cut by x x x x. The cross] lines thus



Sunnyside Poultry House.

Plans and Specifications by J. W. RUSSELL, Vermillion.
South Dakota.

—||—||—||—||—are the partitions separating each pen and are boarded tight 18 inches high, then latticed with lath or wire netting. The water troughs are made to slide under the partition, which of itself forms a fence to keep fowls from getting any more than their heads in to drink. The height of front to eaves is 9 feet: the other one foot can be run up past and a board put on, which adds to the appearance of outside. The back is 6 feet high, which allows a drop of 3 feet to 18, amply sufficient to run off water. The two middle posts are shown in cut simply to give a plainer view of where the divisions are on inside.

COST OF MATERIAL.

| | |
|--|---------|
| 480 ft. common boards for roof | \$ 7.68 |
| 600 ft. ship caps for sides and ends | 10.80 |
| 40 pieces 2x4 12 ft., 10 pieces 2x4 18 ft. | 8.00 |
| 3 large windows | 1.00 |
| 3 small windows | 1.00 |
| 100 pounds tar felt | 3.00 |
| 30 ft. wire netting 4 ft. wide | 1.35 |
| 5 bunches lath | 88 |
| Nails and lock | 1.00 |

Total cost \$34.71

The above does not include cost of labor on building.

An \$18 House.

The cut on next page figures illustrate a cheap and comfortable poultry house. The posts are seven feet and the distance from ground to ridge of roof is 10 feet. The dimensions of the building are 10x20 feet. The east side is covered by 1x3 inch strips two inches apart. The south side is boarded up three feet from bottom, stripped four feet, and then boarded to peak of roof. The north and west sides are boarded up tight. This gives protection for cold weather in this climate (Mississippi) and is very cool in summer. In a colder climate it would probably be necessary to board all sides of building up tight.

The house is divided into four compartments by wire netting with two 12 inch boards at base, which is sufficient to keep cocks from fighting. For roosts, I use pine trees about five inches in diameter. The nest boxes are in the rear of each

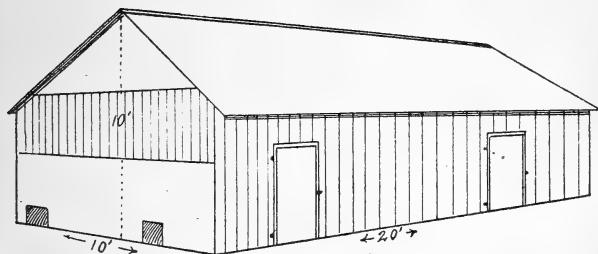


FIG. 1.

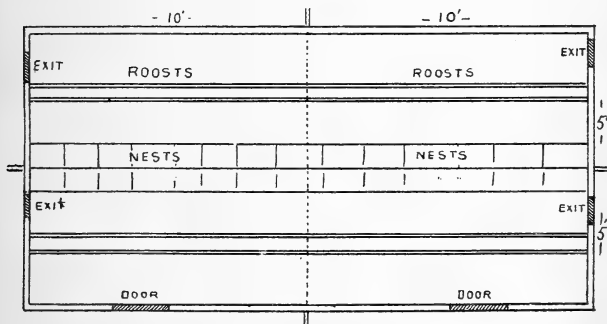


FIG. 2.

An \$18 House.

Plans and Specifications by A. E. SHAW, Bay St. Louis, Miss.

pen, as shown in illustration. In this house were kept four breeding pens of fowls, one cock and 10 hens to each yard. They thrive well and were seldom troubled with disease of any kind.

COST OF MATERIAL.

| | |
|--|---------------|
| 825 ft. 1x12 boards @ \$10 per M | \$ 8.25 |
| 200 ft. 1x3 boards @ \$10 per M | 2.00 |
| 180 ft. 2x3 for framing | 90 |
| 30 ft. 2 in. wire mesh six feet wide | 50 |
| Nails | 50 |
| Staples for wire netting | 10 |
| 4 pairs of hinges with screws | 60 |
| Labor of one man two days @ \$2.50 | 5.00 |
| Total cost | <hr/> \$17.85 |

A House Costing \$34.

The sketch on next page represents a poultry house suitable for a person keeping a small number of fowls. The size of house is 38 ft. long and 8 ft. wide, 8 ft. high in front and 6 ft. high in rear, in other words a lean-to shed with sufficient slope to the roof to shed the water readily; 6 ft. on each side of this building is utilized as open sheds. The 16 ft. in-center is boarded tightly all around, except a door in each end to admit to the shed on either end. In building the house use either 2x4 or 3x4 scantling for posts, sills and frame work of house: for weather boarding and roof use one inch thick and 12-inch wide hemlock boards, same to be placed up and down and cleat with ordinary building laths to keep out draughts. The flat roof is covered with standard roofing paper properly cleated and then covered with two coats roofing paint. The house should front south, and in front make two windows of 9x12 glass. Sheds are closed in on all sides except front, where there is a wire-covered door 3 ft. wide 6 ft. high, the balance of front to be covered with wire in order to admit sunlight.

In the sheds may be placed food and water for the fowls and also a box 3x6 ft. for dust bath. A box properly partitioned can also be placed in the sheds for bone and oyster shells. This shed will afford shade in the summer time and protection to fowls in the winter. The main house is divided into

two rooms 8x8, partitioned off with wire, with 3 ft. hall on one side running the entire length of house, partitioned off with wire or laths. In each room there is a platform 2 ft.

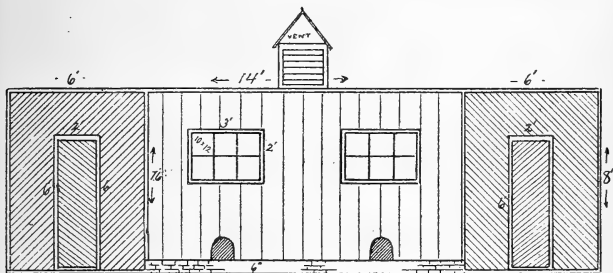


FIG. 1.

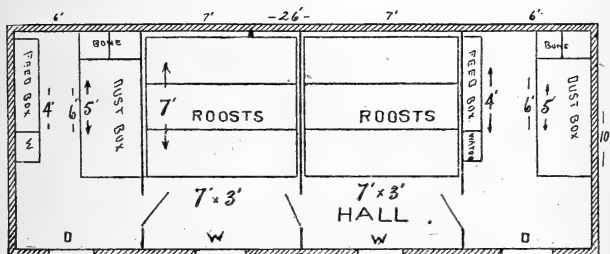


FIG. 2.

A House Costing \$34.

Plans and Specifications by J. G. LONGFELLOW, Clayton, Del.

high and 7 feet long, under which place nest, using nail kegs with part of one side cut out. In front of platform make a door 1 ft. wide and 7 ft. long through which to get eggs from

nests. In making platform 7 ft. long it will leave 1 ft. space in front for hens to go under platform to lay. The top to platform should be on hinges to raise up out of way when it is necessary to clean behind it. Over top of platform place roosting poles $1\frac{1}{2}$ ft. apart and 2 ft. above platform: these roosts should be on hinges so as to be thrown out of the way during day. The floor of the house should be dirt unless in damp locality where board floor is best. Ventilator is shown at top of house 2 ft. high and 1 ft. wide, and is to be closed in winter time. No further detailed explanation of drawings is necessary, as they are self-explanatory.

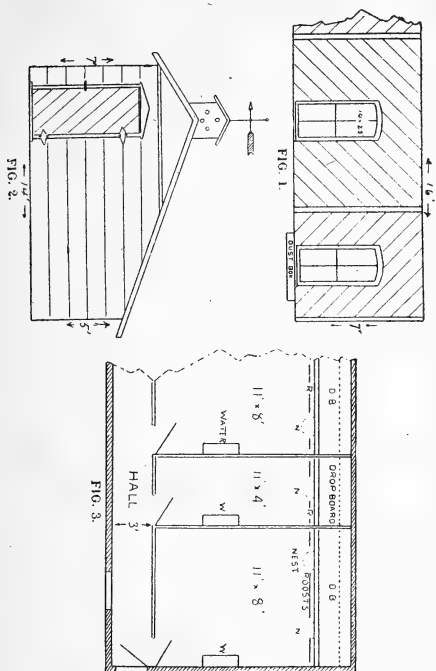
COST OF MATERIAL.

| | |
|-----------------------------------|---------|
| 850 ft. pine siding | \$15.60 |
| 262 feet 3x4 scantling | 4.32 |
| 2 windows, glasses 9x12 | 1.20 |
| Roofing paper | 2.50 |
| Nails | 50 |
| Hardware | 50 |
| Wire netting | 1.66 |
| Laths | 35 |
| Labor | 5.00 |
| Paint | 2.00 |
| Total cost | \$33.63 |

A Canadian Poultry House—Cost \$55.

The sketch on page 29 illustrates a convenient house for fowls, the cost of which, not including labor, was \$54.52. The building is 14x32, and 7 ft. high at front and 5 ft. at rear. Only a short section is shown in the cut. The roof is sheathed with inch hemlock covered with tarred paper over which No. 1 shingles are laid 5 inches to weather. Windows and doors are all double. Front and ends are sided with V joint matched stuff and painted; rear is covered with common rough lumber. This completes the outside.

There are two pens 6x14, one at each end, without floor, with ground dust box in each just in front of window. The other 20 ft. is divided into three pens, two of them are 11x18 ft. each, and one is 11x4 ft. There is a 3 ft. hall running full length of the 20 ft., and a door on each end to get into the



A Canadian Poultry House—Cost \$55.

Plans and Specifications by D. L. SOMERVILLE, Stewarttown, Ont.

exercise room. Fowls go through slide doors which are 8x10 in. All outside walls are grouted between outside siding and inside lining; grouting is made rich with lime. Lathing and plastering, one good heavy coat, completes the inside walls. Pens are divided 2 ft. up from bottom with $\frac{1}{2}$ -in. base-boards. Then to ceiling there is lattice work. The doors into pens are lattice work also. Roost poles are 2x4 in. rounded on top corners and a groove plowed down the center $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. deep to within 2 or 3 in. of either end for coal oil as lice preventive. Bottom of same is well painted with pine tar. The perches rest on brackets at ends 2 $\frac{1}{2}$ ft. from floor. Drop boards are under roosts and nests are under drop boards which form top of nest boxes.

The middle or small pen is used for sundry purposes. The 20x14 ft. is doubled floored with rough pine.

COST OF MATERIAL.

| | |
|-----------------------------------|---------------|
| 3 4x6 in. 20 ft | \$ 1.40 |
| 2 4x6 in. 32 ft | 1.53 |
| 6 4x6 in. 14 ft | 2.16 |
| 30 2x4 in | 2.00 |
| 560 ft. common flooring | 4.48 |
| 1,000 ft. good culls | 6.00 |
| 400 ft. dressed siding | 8.00 |
| 5 square No. 1 shingle | 10.00 |
| Windows | 9.60 |
| Hardware | 1.50 |
| Tar paper | 3.00 |
| Lath and plastering | 4.85 |
| Total cost | <hr/> \$55.52 |

A \$100 Poultry Building.

The building, Fig. 1, is 16 feet wide and 32 feet long, with alley three feet wide near the center, the floor of which is two feet above the floor of the house, thus giving a good, dark, quiet place for nests, which are located under floor at A, Fig. 2, and are easily reached through trap doors, B (shown at Fig. 4) in alley floor. The partition between the roosting and laying pen and the scratching pen below alley floor is solid, except a slide door 1 foot wide by 1 $\frac{1}{2}$ feet high.

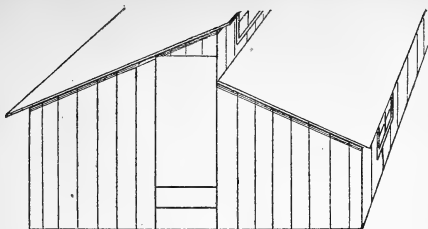


FIG. 1.

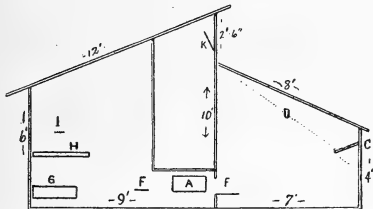


FIG. 2.

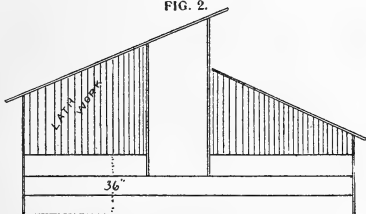


FIG. 3.

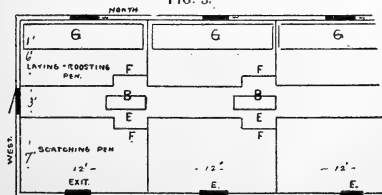


FIG. 4.

A \$100 Poultry Building.
Plans and Specifications by F. A. RAPPEYE, Farmer, N. Y.

The scratching pens are 7x12 feet each and are lighted by the window, C (Fig. 1), hinged at top, fastened with cupboard catch by gravity and opened or closed from alley by cord. E, in Fig. 3, represents doors from alley into pens on either side. The doors are made of lath. One short board forms a step, F, making it easy to go from alley into pens. The dust bath boxes, G, are 2 feet wide and 6 inches deep and two feet above them are the platforms, H, to catch the droppings; one foot above these are the roosts, I.

By means of the lower windows, C, sufficient light is provided in scratching pens; and through upper windows, K, good light is given for the dust baths, G, in the north part of the pen. In the summer, the sun being high, no direct sunshine enters either part of the pen and by keeping both sets of windows open it makes a very cool place for the fowls. The nests, below alley floor, are 1 foot deep and 1½ feet square, open at top and about two-thirds of the way down the south side. They have a small piece of narrow board nailed across the bottom and extending out on the south side for a step for the hens in going on and off the nest.

The building is constructed of hemlock lumber and covered entirely with roofing paper, and costs complete about \$3 per running foot.

COST OF MATERIAL.

| | |
|--|---------|
| 2,500 ft. hemlock (@ \$15 | \$37.50 |
| 1,500 ft. Neponset roofing | 15.00 |
| 18 sash, 6 lights, 8x10 | 9.00 |
| 50 lbs. 8d wire nails | 1.50 |
| 10 lbs. 2d wire nails | 25 |
| 1 hasp, 2 hooks, 36 pairs 2 in. butts, 2 pairs 6 in. T hinges | 2.00 |
| 500 laths | 1.50 |
| Carting | 4.50 |
| Carpenter work | 25.00 |
| Boxes for nests | 50 |
| Posts for foundation | 1.50 |
| Total cost | \$98.25 |

If a man happens to be handy with carpenters' tools and does the work himself, the \$25 could then be saved, thus reducing the cost to about \$70.



FIG. 1.

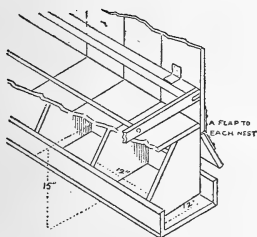


FIG. 2.

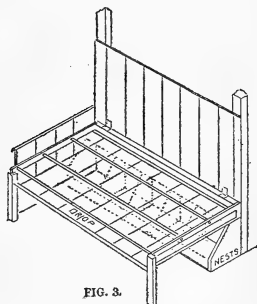


FIG. 3.

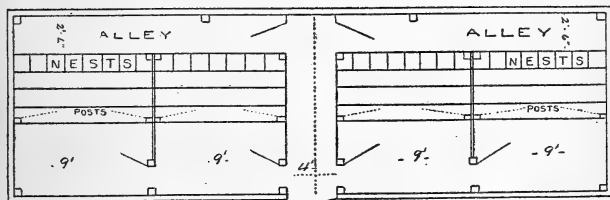


FIG. 4

A Building Costing about \$80.

Plans and Specifications by FRANK LOSEE, Brooklyn, N. Y.

A Building Costing about \$80.

The building shown at Fig. 1 of the accompanying engraving is 40 ft. front by 12 ft. in width, and same plans can be adapted to a lean-to structure if preferred. The arrangement of interior is simple. An alley 2 ft. 6 in. wide extends full length of building (see Fig. 4) with a cross alley 4 ft. wide from which entrance is had to the pens. Each pen is about 9 ft. square. The nests are so arranged as to be accessible for gathering the eggs from the long alley. At Fig. 2 section of nest boxes and roosting perches is shown. The nests are one foot square with an opening to each box in alley-way. The location of the roosting perches and drop-boards may be seen at Fig. 3. The perches are on a hinged frame so that they may be turned up out of the way when drop-board is cleaned.

The house is sided with boards. The windows are 3x5 ft. 2 in. Partitions are boarded up 2 ft. from ground and above the boards there is 4 ft. wire netting. The inside doors are simply frames covered with wire. The following shows

THE COST OF MATERIAL.

| | |
|--|---------------|
| 1,300 sq. ft. matched boards, spruce | \$26 00 |
| 350 ft. 2x4 joist | 4.00 |
| 300 ft. 2x3 scantling | 3.50 |
| 4 windows | 20.00 |
| 250 sq. ft. wire netting | 3.75 |
| 300 sq. ft. tar roofing | 6.00 |
| Nails and hardware | 1.00 |
| Labor of carpenter | 18.00 |
| Total cost | <hr/> \$82.25 |

Each additional running foot front will cost about \$2.25.

A Plain Structure for \$30.

The building here described is intended to accommodate 30 fowls. Its construction is simple and easily understood from the illustration. It is 30 ft. long, 10 ft. wide and 8 ft. high in front, 6 ft. in rear. Roof is of tarred paper. The hall is 4x4 ft., from which entrance is had to the pens. The light lines shown at either side of entrance are to represent

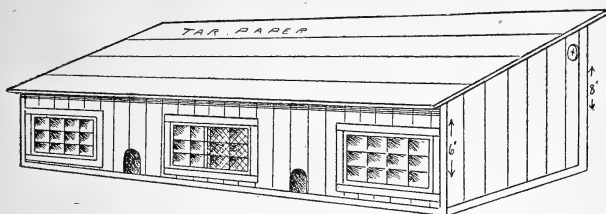


FIG. 1.

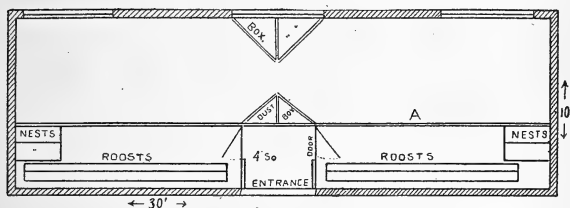


FIG. 2

A Plain Structure for \$30.

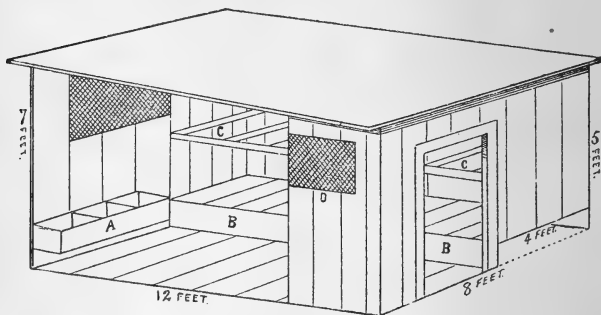
sliding doors which may be lifted to admit a wheelbarrow into which the droppings may easily be swept from drop-boards under the roosts. At the letters A A, a 6-inch board is set up on edge and gravel is filled in from it to the outer side of pen. The plan should show two scratching pens, the partition between the two having been omitted in the drawing, however.

COST OF MATERIAL.

| | |
|---|----------------|
| 1,500 ft. common siding | \$18.00 |
| 300 ft. rafters, posts and plates | 3.60 |
| Windows | 4.00 |
| Tar paper for roof | 3.80 |
| Door fixtures, nails, etc | 60 |
| Total cost | <u>\$30.00</u> |

A House for 50 Fowls—Cost \$22.

This building is 12 ft. long, 8 ft. wide, 7 ft. high in front with 2 ft. fall. Ordinary boxing lumber battened with tin strips is used for siding, nailed to a base and top frame of 2x4 in. stuff. The roof is shingled. There are three openings (two windows covered with wire netting and one large door), one small window in the rear, a large window in the front side and the door in this end, as shown by the illustration. The small window in rear end is 2 ft. wide, 3 ft. long, 4 ft. from the floor running 1 ft. from the left-hand corner, not to



A House for Fifty Fowls.

Plans and Specifications by W. A. THORP, Dallas, Texas.

extend over the platform; the window in front of building is 2 ft. wide, 10 ft. long, 4 ft. from floor, running 1 ft. from either corner; the door is 3 ft. wide, 5 ft. high and just opposite the rear window. In the bottom of the large door is a 7x12 in. slide door for the fowls to pass out and in when the large door is closed. Boxing lumber is used for flooring laid on 2x4 in. sleepers, the right-hand half of the floor being 1 ft. above the base or left-hand half, making a platform over which the roosting frame is placed, and under which the fowls may go for shelter from hot sun and bad weather. The roosting frame (C) is 9 feet long, 3½ ft. wide, made of 2x4 in. stuff with 1x3 in. perches every 1½ ft. apart crosswise of the

frame, the same being suspended by wire from the rafters 3 ft. above the platform running lengthwise from the rear end, thus leaving 3 ft. of this end of the platform on which to set feed troughs, water vessels, etc., as the lower floor is for litter and the dust bath. The nest boxes (A) are made of boxing lumber and nailed to the siding of the building. The lower floor and platform (B) are divided by a 12 in. board running lengthwise of the building. The object of the platform floor under roosts is that it will be easier cleaned, and as the front part of the floor will be used to scatter litter on, the other end of platform will be used for feed troughs and water vessel.

COST OF MATERIAL.

| | |
|---|----------------|
| 350 ft. boxing lumber at \$1.60 | \$ 5.60 |
| 150 ft. 2x4 in. plank at \$1.60 | 2.40 |
| 350 ft. 1x3 in. stuff at \$1.60 | 5.60 |
| 1½ M shingles at \$2 | 3.00 |
| Hardware—nails, hinges, wire netting, etc | 1.40 |
| Labor—two men one day at \$2 | 4.00 |
| Total cost | <u>\$22.00</u> |



Poultry Diseases.

ALL varieties of poultry are subject to disorders and ailments that need medical treatment in order to assist nature to resume its healthful sway, and our aim for the administration of medicine should be to cooperate with nature and assist her in the effort to restore the fowl to health. Fowls being dumb, can not, as a human being can, tell where pain is located, or by giving its sensations aid the physician in making a correct diagnosis of the disease, hence the "doctor" must be guided solely by the outward indication of the fowl, and must prescribe according to what his eyes alone can see. Therefore we can not always be sure that we have determined the right disease nor prescribed the right remedy for it, and we therefore caution those who use this little book to note and carefully compare the symptoms of the fowl with those given here, as great care has been taken to give in as few words as possible the correct indication of each disease described. As for the remedies we have given, we believe them to be the best now known; but it should be remembered that no medicine can be a specific, and that if one valuable fowl in five is saved, when ill, by the use of these remedies, the usual average in such cases will be more than accomplished.

But we wish to impress upon all breeders of poultry the importance of keeping in mind at all times the old adage that "an ounce of prevention is better than a pound of cure." Fowls need but little medicine if properly cared for, the essential feature of which is being well protected from the wind and rain, having dry, clean, light, warm and well-ventilated quarters, with a good grass run in the summer, and plenty of fresh cool water. If these conditions are complied with, and the fowls are well fed and their bowels kept

regulated by a tonic food, such as "Combs' Chicken Cholera Cure," we would be willing to insure against disease, unless it was introduced by some fowl that was already diseased.

To be successful in raising either fine or common poultry requires strict attention to the details above given, and a reasonable amount of common sense. Both these being supplied, success is as certain as any other business, and will prove very remunerative.

In conclusion, we would say: If you expect any medicine to cure disease, it must be administered when the fowls are first attacked, for if delayed too long the fowl will surely die.

Roup.

CAUSE: This is considered one of the most dreaded and contagious diseases of poultry. It is caused principally by a neglect or want of attention to minor diseases of the air passages produced by colds. If the breeder will attend to it in time he will not only save himself a great deal of unpleasant doctoring, but the lives of many birds.

SYMPTOMS: Are the same as in almost all other diseases produced by exposure to cold, wet and damp atmosphere, only it is of a more aggravated form; the discharge from the nose and eyes becomes thick, opaque and very offensive, the nostrils become filled up and closed by the discharge, the eye-lids become swollen and stuck together, and often the eye-ball is quite concealed, and in severe cases the whole face is considerably swelled by the diseased secretion, and the poor bird, being unable to see to feed itself, rapidly sinks away. The disease is highly contagious, it being communicated by the effluvia arising from the discharge as well as by the contaminating of the drinking water by the sick bird's beak while drinking. Diseased birds, as soon as noticed, should be immediately removed from their well companions.

TREATMENT: Every poultry keeper should have a hospital or dry room for sick fowls. Care should be taken to have it warm and carefully ventilated. Clean straw spread over the floor is of great importance. When it becomes soiled burn it and replace it with fresh. When you discover a fowl with symptoms of roup, remove it from the healthy flock to the hospital or to some room where it can receive care and medical treatment.

With our long experience we have found nothing that will effect a relief and cure more rapidly than our own remedy, "The Reliable Roup Cure." Sent by mail, postpaid, \$1.00 per bottle.

After you have secured the diseased bird in a comfortable place, remove the discharge from the eyes and mouth with a soft cloth and warm water. Add *one* teaspoonful of roup mixture to half pint of pure cold water and let the fowl use this for a drink. Furnish them no other water after cleaning the nose and mouth as mentioned above. Then with the medicine dropper, which is furnished with each package of Reliable Roup Cure, inject 4 or 5 drops in the nostrils and roof of the mouth. Do this once or twice a day, and unless a hopeless case an improvement will be readily observed. An onion cut up fine and mixed with the food will be found to be very good. Feed no grain, and give the fowl nothing but cooked feed until entirely well.

IMPORTANT: In treating roup, be careful to remove any discharge from the nostrils that may collect on the *feathers under the wings* or on the breast. Whiskey or alcohol will wash off this discharge. Be sure to protect the sick fowls from all draughts and feed easily digested foods. When the fowls look stupid and droopy, feathers ruffled and no appetite, reduce their food even to fasting. If digestion is impaired give the following:

Tincture of Nux vomica, - - - one drachm.
Alcohol dil. (half water), - - - nine drachms.

Mix. Add fifteen drops to half pint of water and let the sick fowls use it as a drink once or twice daily until better. This is a valuable stomach tonic, especially where food disagrees.

Compound tincture of cinchona, twenty drops in a half pint of water, is often serviceable as a general tonic.

It often occurs that fowls have swellings on the head and feet which are sometimes troublesome. Where it is possible, use a bandage or compress with warm water; then apply the following:

Oxide of Zinc Ointment, - - - one ounce.
Stramonium Ointment, - - - half ounce.

Mix. This can be applied in all cases where an ointment is necessary.

Cholera.

CAUSE: This disease is more to be dreaded than roup, or any other disease that poultry is subject to, as it is of a miasmatic origin, epidemic and very contagious. It is caused principally by overcrowding, keeping too many fowls in one place, bad sanitary management, unwholesome or irregular food, etc.

SYMPTOMS: The symptoms of chicken cholera are not well understood by the people generally, and it is probable that some men have that disease "on the brain," and so much so, in fact, that whenever they lose fowls by any unusual disease that they do not understand they attribute their death to cholera. Many fowls go to their graves, so to speak, by other diseases, and cholera is blamed for sending them there.

Every one who keeps fowls should be able to distinguish cholera from other diseases, for without such knowledge intelligent treatment is an impossibility.

Some of the prominent symptoms we give, and so far as known the condition of the internal organs.

EXTERNAL SYMPTOMS: The fowl has a dejected, sleepy and drooping appearance, and does not plume itself; it is very thirsty, has a slow, stalking gait, and gapes often. Sometimes the fowl staggers and falls down from great weakness. The comb and wattles lose their natural color, generally turning pale, but sometimes they are dark. There is diarrhoea with a greenish discharge, or like sulphur and water. afterwards it becomes thin and frothy. Prostration comes on, the crop fills with mucus and wind, and at last the food is not digested, breathing is heavy and fast, the eyes close, and in a few hours the fowl dies.

When fowls die it is very easy to say that they *died of cholera*, and so let it go; but if the symptoms were not substantially as given above, an *autopsy* would show that it was *not* that disease.

On dissecting a fowl that has died of cholera, the gizzard will be found to be filled with dried-up or sometimes with a greenish matter, and the crop will be inflated with sour mucus and food. The liver will be much enlarged and flabby, and so tender that it will easily mash in the hand, and generally split open, and in every case is much congested.

The crop and intestines are much inflamed, and the latter are filled with a greenish matter. The heart is also sometimes enlarged.

TREATMENT: At once remove all affected birds, clean up the coops, wash them thoroughly with water containing five ounces of sulphuric acid to the gallon; spade up the runs deeply in the summer and in winter use carbolate of lime freely in all parts of the coops. The sick fowls should be first treated by administering to each fowl Comb's Chicken Cholera Cure (we have found this the most effective of any we have ever used or sold, and, therefore, offer it with confidence) every four hours until they act freely on the bowels; let the drink be scanty, using freely "Douglas Mixture" in it, also adding some tannic acid to it; allow no other drink.

Dr. S. J. Parker, of Ithaca, N. Y., gives the following excellent prescription to be given in the earlier or indigestive stage of the disease, and we advise giving it a trial as soon as the fowls show symptoms of being affected. He says: "I find it best to force down the fowl's throat *Eucalyptus globulus*, ten drops of the strong tincture, common salt four to six grains, and half a teaspoonful of ground cayenne (red) pepper. One dose, in a tablespoonful of water, to be given at once. If the dose takes effect digestion is resumed, and in twenty-four hours the fowl is relieved or decidedly better."

The droppings must be drenched with the sulphuric acid water to destroy the germs and prevent the disease from spreading. When the birds are fed they should have only cooked food, in which "Comb's Chicken Cholera Cure" should be added, one teaspoonful to every quart. This should also be given to those that have not shown symptoms of the disease, as it will prevent many from becoming infected. Our experience and observation leads us to believe that if they can be cured at all, this treatment will give them the best chance for life.

TO PREVENT CHOLERA :

1. Remove all the affected birds.
2. Give tonics, liver stimulants and aids to digestion. To accomplish these objects give our Cholera Cure freely.
3. Give the fowls more space. This may be accomplished by diminishing the number of fowls or by increasing the area of their range and of their houses.

4. The poultry house should be thoroughly ventilated and be kept clean and dry.

5. The buildings, yards and places of resort should be thoroughly disinfected.

6. Give the fowls a "preventative" that will destroy or render inert the poison they have taken into their system. There is nothing known that will accomplish this as quickly and effectually as coal oil. The coal oil should be given three or four times a week, as follows: Take a feeding of corn or wheat and let it soak in the oil a few hours, then feed it to the fowls, or mix in soft feed one tablespoonful to two quarts of corn meal.

Diarrhœa.

CAUSE: Exposure to damp, cold, wet weather, neglect to clean the house or run, or too much green food and not enough grain.

SYMPTOMS: Lassitude and emaciation, voiding of calcareous matter of a white color streaked with yellow, which sticks to the feathers near the vent.

TREATMENT: Give five drops of camphorated spirits on a bolus of meal, or ten drops in a pint of drinking water. or the following prescriptions made up into pills may be given twice a day, viz: Five grains of powdered chalk, five grains of rhubarb and one-half a grain opium, the pill to be of the size of a small pea.

Canker.

OF THE MOUTH, COMB, HEAD AND EYES.

CAUSE: Badly housed, uncleanness. musty or unwholesome food.

SYMPTOMS: The breaking out of cancerous running sores in the head, mouth or throat, accompanied with a watery discharge from the eyes and a mucus secretion in the mouth and throat.

TREATMENT: Wash the head and eyes, and swab out the mouth and throat with a diluted solution of chlorate of potash and alum, equal parts, containing one half water, and remove the ulcers with a quill, and apply nitrate of silver or powdered borax to the places left bare, to be repeated twice a day: also mix a teaspoonful of powdered sulphur in the feed.

Diphtheria, Ulcerated Throat.

CAUSES: Roosting or sleeping in a draft, or being confined in a damp place,

SYMPTOMS: Mouth and throat filling up with a white mucus resembling a thick saliva. Little white ulcers are found on the mouth, involving the throat and tongue. It is contagious, and unless take in time it will generally prove fatal.

TREATMENT: Remove the fowl from its well companions to the hospital room; open the bill and powder the mouth and throat with a mixture of pulverized borax and chlorate of potash, or powdered burnt alum; feed on cooked food of such kind that will not cause a looseness of the bowels, add Reliable Roup Cure as per directions, which accompany each bottle, to their drinking water, and allow no other drink.

Consumption.

CAUSES: It often arises in breeding in and in for too long a period, but most generally it is caused by a neglected cold, or being confined in dark, unhealthy places, which cause scrofulous tubercles on the lungs, liver and other organizations of the body.

SYMPTOMS: The symptoms are hardly observable in the early stages of the disease. In the more advanced state, there is a cough with a wasting away of flesh, and, consequently, indications of weakness, notwithstanding they are well fed. It is considered hereditary, and birds so affected should not be bred from.

TREATMENT: Take a sharp hatchet and apply it just back of the comb. The bird will never be of use, either to breed or eat.

Apoplexy, Vertigo and Epilepsy.

CAUSES: Undue flow of blood to the head, which is usually caused by overfeeding.

SYMPTOMS: Running around in a circle or fluttering about, with apparently little control of the muscular actions.

TREATMENT: Holding the head under a stream of cold water for a short time will arrest the disease: then place the bird in a somewhat dark place by itself; feed sparingly on soft food for a few days. If this fails to cure bleed from the

large vein under the wing. Cut the vein lengthwise with a lancet or sharp knife ; also give an aperient or a tablespoonful of castor oil to a large fowl, or teaspoonful to a small one.

Sore Eyes.

CAUSES: Overheating, dust, dampness or climatic changes.

SYMPTOMS: An apparent watering of the eyes, which, if not attended to timely, will turn into ulcerations.

TREATMENT: Wash the eyes with castile soap and water, and give sulphur in food, and wash the eyes with diluted sulphate of lead.

Costiveness and Constipation.

CAUSE: Too long continued feeding on dry food, without sufficient green vegetables, want of a sufficient supply of pure drinking water, or too close confinement.

SYMPTOMS: Unsuccessful attempts of the fowls to relieve themselves, although they make frequent efforts to do so, and when they succeed it is in small quantities and is hard and dark.

TREATMENT: Give plenty of green food, mix bran and oat meal into soft food, and give ten drops of sulphate of magnesia to a pint of drinking water.

Crop Bound.

CAUSE: The most usual cause is that the fowl has swallowed something that it cannot digest, such as a piece of bone or a stone, which obstructs the natural passage, and leaves the stomach empty, which thereby causes hunger.

SYMPTOMS: Continued hardness of crop, with a disinclination to eat.

TREATMENT: Give a dose of castor oil, two teaspoonfuls. If it does not clear the crop in twenty-four hours, the crop will have to be opened at the side by cutting a slit with a sharp knife. Clean entirely out, and close with a few stitches. Take care not to sew the skin of the bird to the sack of the crop. After sewing, annoint the parts with witch hazel oil, give the fowl no water to drink for twenty-four hours, feed it on soft food for a couple of days ; it will soon recover.

Soft or Swelled Crop.

CAUSES: Fever or inflammation of the crop, which causes the fowl to constantly drink, without partaking of its proper food.

SYMPTOMS: Distension of the crop, the contents of which are of a fluid or soft character, sometimes principally air.

TREATMENT: Slightly acidulate the drinking water with nitric acid, mix a half teaspoonful of sal volatile with each bird's food every morning; also give onions chopped up fine mixed with the food.

Indigestion.

CAUSES: Overfeeding, unwholesome diet, injudicious use of grain, debilitated system, etc. If neglected, it will cause an enlargement of the liver to a serious extent.

SYMPTOMS: Apparent laziness, want of appetite, with scanty and unhealthy droppings.

TREATMENT: Give daily "Comb's Chicken Cholera Cure" according to directions. Finely chopped onions given daily will prove beneficial.

Gapes.

CAUSES: Foul water, exposure to wet, damp places, particularly at night, want of nourishing food, etc.

SYMPTOMS: The general symptoms, as the name implies, consist of constant gaping, coughing and sneezing, together with inactivity and loss of appetite.

TREATMENT: Give the bird daily, until it recovers, a small piece of camphor about as large as a grain of wheat, and a few drops of camphor or turpentine to the drinking water, or mix with the food, about ten drops to the pint.

Pip.

CAUSES: Exposure to damp or wet weather.

SYMPTOMS: A short, quick, spasmodic cough, resembling a chirp, with a stoppage of the nostrils, compelling the bird to respire through the mouth. It is not considered a regular disease itself, but is a symptom only, which if not checked will result in catarrh and oftentimes roup.

TREATMENT: Wash out the mouth and nostrils with a weak solution of chlorinated soda, and use Reliable Roup Cure as directions prescribe. Feed only cooked food.

Bronchitis.

CAUSES: The same cause that produces pip will cause bronchitis.

SYMPTOMS: Rattling in the throat when breathing, caused by cold settling on the lungs of the fowl, and the formation of mucus therefrom rising in the windpipe. If not checked, it is likely to result in consumption.

TREATMENT: Remove to a dry place, and give Reliable Roup Cure with the feed, and slightly acidulate the drinking water with sulphuric and nitric acid.

Debility.

CAUSES: Overshadowing at exhibitions, close confinement without fresh air, or it may be produced by a severe shock.

SYMPTOMS: Drooping without apparent cause, want of appetite, out of condition and general prostration.

TREATMENT. Feed on good, wholesome food, a little at a time, give a raw egg daily until the appetite appears to return, when change to a little cooked meat, and put in ten drops of tincture of muriate of iron in the drinking water.

Black Rot.

CAUSES: This disease is generally caused by want of exercise, continued sameness of food, indigestion and want of green food.

SYMPTOMS: Comb turning black, swelling of the feet and legs, accompanied by gradual emaciation.

TREATMENT: The same as prescribed for indigestion will generally prove effective.

Hernia, or Protrusion of the Egg Passage.

CAUSES: It is caused by the exertions of the hen to expel an unusually large egg, or in old fowls the general relaxation of the system.

SYMPTOMS: Protrusion of the laying gut of the hen, which is forced out to such an extent after laying, that it oftentimes does not recede.

TREATMENT: Put the hen on diet of rice and boiled potatoes. If the gut shows no indication of receding itself, bathe the parts with lukewarm water, and after rubbing the pro-

trusion with witch hazel, linseed or sweet oil, gently press it back into the body. Give daily, a pill composed of two grains of calomel, one-quarter of a grain of tartar emetic, and one grain of opium : the above is for a large fowl, one-half a pill will be sufficient for a small bird. Do not give the fowl any stimulating food.

Soft Eggs.

CAUSES: Overfeeding and the want of the proper material for the hens to eat so as to form the shell.

SYMPTOMS: More or less inflammation of the egg passage, and the appearance of the egg itself.

TREATMENT: Restrain from overfeeding, and place within reach of the hens plenty of old mortar or crushed oyster shells. Where it arises from the inflammation of the egg passage, give a bolus of barley containing one grain of calomel and a half a grain of tartar emetic.

Gout, Rheumatism and Cramp.

CAUSES: Exposure to cold or wet, or roosting in damp, cold houses or places.

SYMPTOMS: These diseases arising from the same causes require the same treatment, though they are of a different nature. They consist of inability to use their limbs or feet, which oftentimes become swollen and feverish or grow stiff and powerless, thereby compelling the bird to sit about, and preventing them from roosting on perches.

TREATMENT: Remove the bird to a comfortable dry place, give plenty of nourishing food, and rub the limbs and feet with witch hazel oil, butter, lard, and give twice a day a pill composed of half a grain colchicum and a grain of opium.

Leg Weakness.

CAUSES: This complaint should not be confounded with the previous one. It often arises from the breeding of the same strain of fowls in and for too long a period, but is usually caused by too high feeding, which increases the weight of the body out of proportion to the muscular strength of the limbs ; it more generally occurs in the large breeds, such as Cochins and Brahmas, particularly in the cockerels.

SYMPTOMS: Squatting around on their hocks, after standing for a short time, as if tired: in bad cases they are unable to stand on their feet at all.

TREATMENT: In the early stage give the following pill twice or three times a day: One grain of sulphate of iron, five grains of phosphate of lime and half a grain of quinine.

Bumble Foot.

CAUSES: This is caused by the birds roosting on a small uneven perch, or in flying down from a high one upon a hard surface, thereby bruising their feet. It occurs mostly with the heavier varieties of fowls.

SYMPTOMS: It commences with a small swelling or corn in the ball of the foot, which enlarges, becomes soft and finally ulcerated.

TREATMENT: Remove the bird to a place without perches. If the foot becomes ulcerated, first wash out the sore with castile soap and warm water, then dip the foot in a solution of one-fourth ounce of sulphate of copper to a quart of water; this may be repeated two or three times a day. If taken in time a cure may be effected by painting the part with iodine. When the tumor is soft or in the form of an abscess, puncture it with a knife and press out the matter, after which cauterize the part with nitrate of silver.

Scaly Legs or Elephantiasis.

CAUSES: Too close confinement or kept in damp, muddy runs, overfeeding, not sufficient meat or green food. The disease is said to be infectious.

SYMPTOMS: The appearance of a whitish scurf which forms on the skin of the legs and toes; if neglected, it becomes hard and warty in appearance.

TREATMENT: Keep the bird in a clean place; wash the legs clean with soap and water, and when they become dry annoint them with lard mixed with sulphur or rub them with coal oil; a few applications will generally suffice.

Bad Moulting.

CAUSES: Though moulting may not be classified as a disease, it is considered the most critical period of the year for old fowls. A greater drain is upon the system of the fowl

during its change of feathers than at any other time, as not only does the life-giving process of nature have to be sustained, but an entire new coat has to be grown. But moulting is generally caused by either too close confinement, improper food or a constitutional weakness of the fowl, occasioned by too long in-and-in breeding.

SYMPTOMS: A general wasting away, inactivity of the bird during the time of process of moulting.

TREATMENT: Take good care that the fowl is kept warm, and not allowed to go in the wet or rain; give soft, warm food in the morning, with good grain mixed with hemp seed in the evening, also a little chopped meat daily, or bread soaked in ale; also add Our Reliable Tonic to the drinking water, a teaspoonful to a pint of water.

Bad Fledging.

CAUSES: The ailment occurs in chicks; it is very similar to moulting in fowls, and it is occasioned principally by the same causes, has generally the same symptoms, and is alleviated by the same remedies.

Chicken Pox.

CAUSES: This disease is frequently caused by unfavorable conditions of the atmosphere and generally occurs in cold, wet weather. It is of an infectious character.

SYMPTOMS: The head, face or body is covered with small ulcers, containing an infectious matter.

TREATMENT: First wash with castile soap, and then with a strong solution of chlorate of potash; also mix a little pulverized charcoal and sulphur in the soft food, about a teaspoonful of each to a pint of meal. Anoint the head with "Carbolate of Cosmoline" until cured.

Frosted Comb and Wattles.

CAUSES: Exposure to cold, freezing weather, more particularly at night.

SYMPTOMS: Discoloration of the top of the comb and edges of the wattles, which first turn a purplish color and afterwards become pale and bloodless.

TREATMENT: Anoint the parts with the witch hazel oil, bathe with cold water, after which apply glycerine and "Carbolate of Cosmoline."

Vermin.

CAUSES: Filthiness of quarters, foul nests, want of earth baths.

SYMPTOMS: General wasting away, with a constant pecking and scratching of the body.

TREATMENT: Clean out and fumigate the hen house by closing it up tight and burning sulphur therein; make new nests, with a dust bath mixed with powdered carbolate of lime, also put into the roots of the feathers of the fowls Persian insect powder, and if the bird appears suffering from debility, treat it the same as already prescribed.

Douglas Mixture.

"Douglas Mixture" is made thus: Take of sulphate of iron (common copperas), 8 ounces; sulphuric acid, $\frac{1}{2}$ fluid ounce. Put into a bottle or jug one gallon of water, into this put the sulphate of iron. As soon as the iron is dissolved add the acid, and when it is clear, the "mixture" is ready for use.

In hot weather, or when the flock is small, less may be prepared at once, but the above proportion should be observed. This "mixture" or tonic should be given in the drinking water every other day — a gill for every twenty-five head is not too much — and where there is infection it must be used every day, but where there is no disease, not so often, or in smaller quantities if it be used every day.

This preparation, simple as it is, is one of the best tonics for poultry known. It is alterative as well as tonic, and possesses, beside, antiseptic properties which make it a *remedy* as well as a *tonic*.

Contagious Diseases.

Colds, roup, diphtheria are highly catching, and such cases should at once be isolated. Birds suffering from diarrhoea or cholera should be parted also, as they make the ground very unhealthy for the other stock. The slightest ailment should *at first* be treated as contagious and isolation effected. When

the nature of the complaint is discovered, treat accordingly. Doctoring poultry is most troublesome and very expensive; revention is better than cure.

Crowding.

One of the commonest evils, and fatal to success. Most amateurs go in for several breeds of poultry. Would advise starting with one or two breeds at first. The birds may be kept in comparative comfort during the winter months, but in the breeding season when the chickens begin to come, and in August, when pullets have to be separated from cockerels, and these again in October kept separate from adult hens—when these also have to be parted from their mates, and exhibition birds require each their roomy and separate pen—it is impossible to rear many breeds successfully, each having its perfect exhibition specimen. For this, space is a matter of necessity.

Dampness.

Dampness in poultry-houses is especially injurious to health. Care should be taken to stop all leakage, and to insure dry sleeping-places. Birds will bear being out on a grass-run on the wettest days better than being housed in a damp place. Carelessness in this respect is the source of colds, inflammation of the stomach and liver disease, and is apt to develop scrofulous deposits should the strain be weakly in any way.

Dropping Eggs.

This is caused by too stimulating diet, also by want of lime, oyster-shells or grit for shell formation, also by the hens being too fat. Feed less, give no meat for a time, vary the diet with rice, potatoes and wheat. Give a dose or two of castor oil, and iron tonic in the water. Should this not cure the evil, give one grain of calomel and one-twelfth grain of tartar emetic.

Dusting.

Poultry are in the habit of cleaning themselves in dry dust, mortar, rubbish or ashes by scartching the dust up in their feathers. This keeps them in health, and prevents vermin. Provide a dust bath for the purpose—a good large box with sides about a foot high filled with dust, dry screened

mortar refuse, road scrapings, fine gravel or sand, or let the whole sheltered run be covered deep in the above, in which case no special bath is necessary. Hens are wretched if this absolute necessity for their comfort is not studied. The dust bath, however, has its dangers in the case of hens with newly hatched broods.

Bone Dust.

Very beneficial for the feeding of growing birds up to five or six months of age; a preventative of weak legs and diarrhoea; an aid also in postponing the development of young birds, while it provides materials needful for continuous growth, and gives strength and size to the frame. It should be about the fineness of coarse oatmeal, and should be sifted into and with the meals used, in the proportion of three ounces to the pound. Fresh bones chopped and pounded, or burnt bones, are not so useful for the above purposes as they are for laying stock or for birds of an age for exhibition.

Hereditary Diseases and Evils.

Consumption is the disease most carefully to be guarded against. A consumptive strain will be a constant source of care and disappointment. Squirrel tail is sure to be reproduced in many of the young birds. Wry tail is also hereditary. Crooked breasts, thumb marks on combs or any peculiarity in the spikes of the comb, white face where red is the proper color, is dangerously hereditary, ear-lobes splashed or marked with red where pure white is a point, vulture hock, all these defects will be reproduced. Birds with malformations or anything missing, such as being short a toe, or having any peculiarities, should not be used for breeding.

Hospital.

Every poultry yard in which, say, even 100 birds are reared yearly, should be provided with a place specially devoted to penning sick birds, where an invalid can be at once isolated and properly doctored. This place must be open to the sun, screened from the east wind, dust dry, freely ventilated, yet free from draught, and warm. The hospital should be white-washed with hot lime frequently, and perfect cleanliness maintained.

Pullets not Laying.

If they are over six months old they are either over-fed, which can be ascertained by feeling their condition and weighing, or under-fed. If pullets are much exhibited and the runs often changed, this will prevent egg production. Should the birds be thin, give meat and a little stimulant, such as buckwheat and sunflower seed; if fat, reduce diet and give an aperient. Constant exhibiting is very fatal to laying.

Early Opening of Houses.

This has much to do with health, and if birds that rise with the sun are shut up in close, ill-ventilated roosting-places till 7 or 8 A. M., no success will attend the mismanaging owner. The roosting house should open into a covered run, which the birds can enter at their own free will, to find a little food and to amuse themselves till the attendant comes his rounds, which he must do in summer at 6 A. M.

To Prevent Laying.

Birds for show have, at times, to be kept back. They are in show form just when they begin to lay, and never look so well after. If they are early and you wish to delay laying, and so prolong the period of growth, move the pullets about from one run to another.

Slipped Wing.

This chiefly occurs with fast-growing cockerels and ducklings. The primary feathers, which are naturally tucked up out of sight, stick or trail out; the bird has no power to tuck them up. Should the same feathers stick out and appear twisted, so that the inside of the quill is outside, it is probably an hereditary evil. In the first instance, it frequently occurs from a number of cocks being kept together, giving rise to some ill treatment, constant racing about and nervous flapping of the wings; these being soft and delicate as yet, the birds fail to fold them in closely, and a habit is acquired of letting them hang down out of place. Tucking them up into place when the bird is asleep at night is sometimes effectual. But the best way is to sew a band around the

wing-feathers near the shoulder, and attach this to another which is passed round the joint of the wing, to prevent it slipping off. It is work of patience and difficulty.

Fresh Blood.

If birds are bred in-and-in too closely, many evils will ensue—loss of size, fewer eggs will be laid and a general want of stamina will be observable. It is well, therefore, occasionally to purchase a cock from one of the best yards, and if it is for show purposes, ascertain the pedigree and if possible see the pen from which he was hatched. It is the easiest thing in the world to introduce a glaring defect into your flock, and one of the most difficult to breed a fault out. Where birds are kept in separate runs and pens the produce for the following year or two will not be so nearly related as to require invigorating by fresh blood; in fact any large breeder of a well-known strain will be very shy of introducing new stock for any purpose. By a wise system of crossing and separation, thoroughly unrelated birds can be kept ready to hand for the mating season.

Feather Eating.

A horrid practice, one might almost call a disease, to which fowls brought up in confinement are liable, which dirt and crowding encourage. Idleness is one cause: poultry are often kept in a pen where they have no means of scratching about or amusing themselves. The earth should be forked up, thrown into heaps, and straw thrown over it. This will give occupation and tend to arrest the evil. Want of fresh water is another source of the disease; the water should be replenished often, and kept in the shade. Cabbages tied up whole and tightly to the wall of pens will amuse and serve to pass the time, and a piece of meat hung up just within reach will be useful. Should any birds be so injured as to have the stumps of feathers bleeding, those must be pulled out by the roots, and the tender places annointed with a salve of vaseline mixed with carbolic acid, ten grains to the ounce. This will be healing and at the same time unpalatable to the offending birds. Lettuce in large quantities should be given. Linseed made into a mash with pollards, boiled to a jelly, is excellent

for the deranged system. If the case is desperate, give daily an eighth to a fourth grain of acetate of morphia. The offending bird should be removed from the run.

To Secure Early Laying.

Hatch early, and do not move pullets about to various runs when they are maturing. Do not depend on old hens, but on March pullets, kept in warm quarters, fed on meat and plenty of green food. Occasional treats of bread soaked in ale, hot, and our "Poultry Tonic" mixed in the food and given hot at daybreak, will hasten the filling of the winter egg-basket.

Laying Mixtures.

There are many mixtures and condiments advertised in the poultry journals daily which have the effect of stimulating the hen's laying powers, if desired, but few should be used, as many are prejudicial. If the above diet is kept too, the birds must lay; if they do not, either suspect and look out for rats or egg-eating hens in the flock, or a need of padlocks to the laying-pens.

Cooking Food for Poultry.

A little trouble in this respect will be amply repaid in the poultry yard. Every establishment where 100 head of poultry are kept should have its lock-up food store-room, and if a stove can be put up its help is invaluable. House-scrap can be regularly brought out to the food-house hot from the kitchen by 8 A. M., and with boiling (not cold) water let meals of all sorts in turn be mixed with the scraps till it forms a crumbling mass. All food for ducklings is better given warm than cold; chickens also appreciate their milk and their porridge with the chill off. Liver given raw is not palatable, but if put in water over the stove for ten minutes, and chopped hot, and thrown to the birds in pellets, it is greedily devoured, and more good is got out of it. Grain baked in the oven dry, and given warm to the birds, is very good in the winter time.

Fighting.

Extreme care should be taken to prevent this amongst show-birds, as five minutes' sparring may upset all chance of

a special or prize by injury to comb or feathers. Nail up cloth to all partitions eighteen to twenty-four inches high: this prevents all danger. In cold weather a severe fight may be serious. If the birds are ailing after it, put nitric acid in the water sufficient to taste it, and give a capsule of cod-liver oil with quinine thrice daily. Slip a raw egg down the bird's throat now and then till vigor is restored.

Tonics.

Parrish's Chemical Food: For chickens, fifteen drops three times a day, or, if given in drinking water, two teaspoonfuls to a pint.

Douglas Mixture (see directions).

Quinine and iron tonic (citrate of quinine and iron), four grains to an adult fowl daily.

Sulphuric acid, ten drops, and sulphate of iron, a piece the size of a filbert, in a quart of water for drinking.

Tincture of iron, one teaspoonful in a quart of water.

Nitric acid acts on the liver and is a tonic. Of the dilute acid, four drops in a teaspoonful of water three times a day, or ten drops of strong acid in a quart of water for drinking.

Handling Fowls.

If you catch a bird, leaving its wings free, a desperate struggle will ensue, likely to injure exhibition plumage, or to distract a broody hen from her vocation. Approach the bird from behind, place both hands firmly and quickly over the wing joints, then slip the right hand down and secure the legs firmly. All fluttering will thus be avoided, and the bird, held by the legs with the left hand, will not offer resistance. All catching and handling of fowls should be done at night, or after first making the pen dark, if this is feasible.

Washing Exhibition Birds.

Get two tubs, fill the smaller one with a good lather of soap water (for one bird half a pound of white soap is sufficient); stand the bird in the lather and wash it, using a softish hair brush, and with it your hand. Thoroughly brush and cleanse the feathers everywhere, leaving no spot untouched, and don't be afraid of wetting thoroughly. Use no half measures, and take care not to bend or brush the feathers

the wrong way. This done, having prepared warm water in the larger and deeper tub, dip the bird in and out freely and thoroughly rinse every vestige of lather out; lastly, take a can of merely chilled water (may be *very slightly* tinted with blue for white birds) and pour this over the bird, drain and dry as far as you can in a Turkish towel, place the bird in an exhibition coop and set it at a comfortable distance from the fire. As the bird dries and fluffs out, gradually draw away from the fire. Leave the birds all night in a warm kitchen, and next morning place them in their own preparing pen, which, meantime, has been laid deep in fresh straw. Let them rest here for twenty-four hours, or twelve at any rate, before the journey, otherwise a risk of cold is incurred. After the bath, when still wet, give a teaspoonful of wine, and later a meal of bread and meat scraps, which are gratefully devoured as a rule; by and by a handful of wheat as a treat cast in the straw will tempt them to scratch for it. A moist warm atmosphere must be kept up in the drying coop, or the feathers will not web properly; place water within reach, and add to it a little tonic.

If the birds are not drying properly, try and turn them so that the heat will strike all sides equally. Hard-feathered birds, such as Andalusians, Brown Leghorns, Malays, Dominiques, Game, Black Spanish, do not require so much washing. White birds and Asiatics demand the greater care.

Feeding for Exhibition.

Birds for show should be brought up as directed on page 60, and then about three weeks before exhibition special diet should be given; fresh meat once a day, a piece the size of a walnut; plenty of green food, and twice a week linseed, boiled in water to a jelly. This is much liked, and will lay on flesh and produce gloss on feathers. Bread and milk is excellent for birds that are going to or returning from a show: a few handfuls of hemp at odd times, and best wheat, will get the birds into grand order.

Treatment After Exhibition.

On the arrival of birds from an exhibition, feed them on soft and (if cold weather) warm food, containing a little of our "Poultry Tonic;" give a very little water containing a

tonic. See that they are housed *very* warm. If they are shortly due at another show, give bread and milk for one meal daily, and rice and milk with meat. If the crop is loaded with Indian corn, feed very sparingly, even of soft food, at first, and if it feels *hard*, give a teaspoonful of gin on arrival; it will aid digestion.

Ventilation

Is a neglected but most important subject. Poultry houses are often either draughty or they are unventilated; if the first, the birds are always uncomfortable, and a late egg supply, owing to cold housing, will be the result; if the latter, serious disease will follow, such as diphtheria, or the birds will be dull, without appetite, the wings will droop, upright combs will get blue at the tips, and fall over limp and flabby. Beside the door entrance, every roosting-house should have a window, which can be left open on hot nights, a wire screen of small mesh should be placed over it to keep out enemies; in the winter a piece of perforated zinc is preferable, as it prevents the wind rushing in, and yet gives enough air. If a window is not practicable, a hole under the eaves will answer, covered with zinc wire. The higher up ventilating openings are made the better. Foul air rises, and openings must be made or the fowls will suffer. Ventilating holes should be drilled in all artificial mothers, dryers and shelters; foul air generates very quickly where chickens congregate.

To Hasten Moulting.

Pen up, cocks apart from from hens, in a warm place, deep with sand and mortar siftings. Keep them very warm at night; the older the bird the warmer it should be kept. The process of moulting takes about two months, but at times much less. Food should be given warm, very little at a time, and not stimulating when first penned up; then generous diet, and in a gallon of drinking water put sulphate of iron the size of two filberts and ten drops of sulphuric acid. Non-sitting hens can be hurried on by taking away all stimulating food and placing them in a fresh house. As soon as moult begins, feed well. Should birds moult too slowly, and look ailing, give two or three one grain doses of calomel, a dose of jalap, soft food and meat. The Spanish breeds moult

late and hard; birds with shabby feathers in July cannot be ready in time for September exhibition. If required early they must be preserved from injury, for moult cannot be hurried so early in the season. Meat, green food, with warm housing at night, will bring all birds comfortably through the moulting season. If the shaft of the new feathers seem to stick on too long, not splitting open freely, more stimulating food should be allowed, such as meat, linseed and hemp.

Treatment of Show Birds.

Hatched in the three first months of the year, they must be well fed and housed, and yet allowed perfect freedom on grass runs wherever fine and dry. Soft food should have bone-dust mixed with it, and the meals should be ample and frequent, but never so large as to remain uneaten and to get sour. Meat and green food should be given in plenty. At from three to four months the cockerels should be separated from the pullets: no crowding, no want of cleanliness should be allowed, and no roughing it in bad weather, or the feathers will be soiled. These must be kept spotlessly clean and fresh, and care must be taken that no rough wire or ill-made doors, or awkward perches injure the plumage, on which prizes to a great extent depend. Three weeks before the show, pen the birds, cock and pullet, separately, giving each a friendly companion of their own sex: feed on bread and milk, wheat, and two or three times a week give linseed; boil to a jelly and mix in oat-meal till it is friable: this will gloss the plumage. Also give barley-meal, buckwheat, a little hemp and meat. Let the pens be deep in fresh straw, and see that the dust-baths are very clean. Two days before the show give night and morning a meal of rice boiled in milk, stiff, and plenty of wheat. A little meat chopped into the rice is much enjoyed. Rice is to prevent any chance of diarrhoea in the show pens, which entail extra soiling of the plumage. Green food should be given in plenty, preferably grass, lettuce and spinach. Forty-eight hours before showing, wash the birds if need be. Feed as above until an hour before starting. Lastly, wash the comb, face, etc., with soap and water, dry, and rub over with vinegar: give each bird a teaspoonful of wine—they will then sleep instead of fretting on the journey. Inside the hamper, at the side, tie the top of a loaf of bread soaked in port wine, and a head of lettuce, to

pick at; this will bring them in good condition to the show-pen. If shown in pairs, do not omit, three days before the show, to give the cock or cockerel a hen in his pen, but not one which is to be exhibited. He will then not take much notice when the show pullet is introduced into the exhibition hamper, which should be done about three hours before the train leaves to insure that no fighting occurs.

General Treatment of Chickens.

During the first twenty-four hours give no food, and remove, till all are hatched, from the hen or incubator to a box having ventilating holes bored in the side, and a hot-water bottle slung by means of coarse flannel, so that the chicks may feel the warmth and the least pressure on their backs. When all are hatched, cleanse the nest completely, and well dredge the hen's body with insect powder: give her the chicks and place chopped egg and bread-crumbs within reach. The less they are disturbed during the first two or three days the better.

Warmth is essential, and a constantly brooding hen is a better mother than one which fusses the infant chicks about and keeps calling them too feed. Pen the hen in a coop and let the chicks have free egress. The best place to stand the coop is undersheltered runs, guarded from cold winds, the ground dry and deep in sand and mortar siftings. Further warmth is unnecessary if the mothers are good; and if the roof is of glass, so as to secure every ray of sun, so much the better. Cleanliness of coops, beds, flooring, water vessels and food-tins must be absolute. The oftener the chicks are fed the better, but food must never be left uneaten. Water must be made safe, or drowning and chills may be expected. The moment weather permits, free range on grass for several hours daily is desirable, but shelter should always be at hand.

DIET: The longer the supply of hard-boiled eggs chopped fine is kept up, the better. As the birds get on, every kitchen scrap is invaluable, and the following mixtures may be given for meals in turn as convenient, variety being essential for success: 1st meal, as early as possible—6 A. M.—egg chopped, mixed bread crumbs; 2d meal, kitchen scraps chopped fine in a wooden chopper, given warm, and mixed to a crumbling mass; 3d meal, rice boiled in milk, and dried up crumbly with Scotch oatmeal; 4th meal, barley-meal mixed crumbly

with the liquor in which meat has been boiled; 5th meal, meat chopped fine and bread reduced to crumbs (not necessary daily). These preparations given in turn and with judgment will, with occasional handfuls of small, dry grain and barley and buckwheat baked with water in the oven, give the chickens all that is necessary for building up the strong framework which is essential to a fine-developed bird. *The use of bone dust must be omitted*, and a constant supply of green food, together with mortar, oyster-shell, gravel and all manner of grit and dust should be insured. Pure water, never left to stagnate or freeze or to get hot in the sun, and if possible, milk occasionally, will render the diet perfect. Chicks so kept, the quantity given being increased with their size and appetite, will be found at four months, or, at any rate, at five, to be fit for table without the unhealthy and unpleasant process of cramming. If destined for the show-pen, they will be ready to "go in" for the further care and preparation needed for exhibition. At this age cockerels must be divided from pullets, and the chicken period may be considered over.

Feeding.

HOURS FOR FEEDING: 6 A. M.—Give warm, soft food, as much as will be picked up greedily. Let the birds follow the feeder out of the pens, asking for more, leaving none on the ground.

FOOD FOR ADULT BIRDS: Scraps from the house chopped up and mixed dry with barley or oatmeal boiled in water or pot liquor, not mixed too wet, but in a crumbling mass. In all cooked or soft food the addition of a little of "Our Poultry Tonic" will be found very beneficial, as it tones up and strengthens the digestive organs. It is especially good for young chicks that are feathering out fast, as it helps them to sustain the severe drain on their system. At noon give a little grain, just to amuse and occupy, thrown amongst the straw. In the evening the meal should be timed so as to take place just before roosting-time. It is most important not to send the birds to bed empty. Grain should be given, about a handful to each bird, or even less if it is not picked up clean. To produce eggs, feed bullock's liver, sheep's pluck or meat to each fowl. Ground red pepper also promotes laying, if mixed with the food. Notice that birds always refuse food which has fallen on or near manure; therefore avoid crowding, and

see that you have a thoroughly clean spot on which to spread the food. The adult fowl, whether kept for breeding or laying purposes must not be fattened.

Foretelling Sex of Chicks.

No rule can be laid down about this, and the shape of the egg has nothing to do with it. Early broods bring most *cocks*, late broods the pullets. This is generally the case, but no rule is reliable.



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Hatching Chickens in Incubators.

BY DR. T. B. SPAULDING.

WHEN incubation is ended—that is, when the mass of life within the egg has, by its circulation and inherent heat and vital electric life, absorbed all the moisture and all the animal matter in the egg, and left only the lime, that cracks or pips at point of sharpest pressure, when *thus, the egg is hatched*, comparative physiology affirms, and your own dissection may confirm, that the chick is yet unfinished. I mean by this, its digestive apparatus is yet unprepared to receive supplies of food. The instinct of the hen is so unerring and so adapted to the essential requirements of the chick, that for four and twenty hours she seldom stirs, nor offers to feed her young. During this important interim the yolk that yet remains within the chick is rapidly absorbed, and this, like the first imperfect milk of the mammal mother, affords the only and all-sufficient food that nature intended for these delicate digestive organs.

The first essential duty, then, that devolves upon the artificial father of a flock of little chicks is *not to force their feed*, but wait with intelligent assurance that nature's resources are operative yet; and from its earliest breath digestion starts, and life, health, growth and strength are all sustained full thirty hours by this absorbing yolk. The chick is then prepared for food—its little laboratory is chemically complete and ready to receive only what it can convert most readily to blood, flesh and bone.

The dietics of infancy has always been to me a theme for pleasant and most fruitful thought. The ability to battle well or else encounter all the ills and cares of every life depend in largest measure on the power derived from easy, strong digestion.

Warmth.

Remember the fact that feed is not your first essential work in caring for your incubator brood. The germination and the growth within the egg, and every after chemical and vital agency concerned in early chicken life depend upon high temperature. This constitutes the first and great commandment—*never let your little chicks get chilled*. The subtle chemical, physiological, nutritive changes (which terms imply an act essentially the same) are all carried on under high temperature. "Vital temperature" means that degree of heat wherein the nutrient changes are most perfectly and pleasantly performed. Lower the temperature that surrounds *any* young existence, and you *check their essential nutritive changes* and so disorder their *nutrition* and beget disease and death.

Health is the perfect harmony of nutritious changes or *physiological ease*. A *departure* from health is a *disturbed* nutritive change or *physiological disease*. It is, therefore, plain that *heat* is consistent with life, while *cold* is in the direction of death. The young chick, if allowed to become chilled during the first thirty hours, will *check the absorption of its yolk*, and so end its existence.

The Nursery.

In the light which physical science thus affords, we find that cold engenders innutrition and *innutrition* is the essence of all disease. Our first essential duty, then, is to keep the young chicks warm until nutrition starts and sustains their growth, and the growth and strength strengthens, in turn, nutrition. With this end in view you need a chicken nursery. Select a site exposed alike to eastern and southern sunshine, then build an *earthen bed* full 1 foot high, 18 feet wide and about 100 feet long; about 5 feet from either outer edge and about 8 feet apart, put down 2 rows of tile, running parallel the whole 100 feet; cover these with moistened clay or mud about 6 inches deep, and over this top-dress 6 inches deep *with sand*. Now build a furnace at each diagonal end of the tile and a chimney at each other end, and then you have at once a furnace and foundation for your infant poultry nursery. Now build the habitation large and light, and per

fectly impervious to wind and water, and thus you have the cosiest and cheapest chicken nursery that genius can contrive.

Let *heat* be regulated by a *thermostate*, which, when the temperature ascends above a definite degree, will open a valve and let in air. Such an edifice will cost about \$300, and can easily accommodate 3,000 chicks.

How to Feed.

This fixed (before the chicks are hatched), we place them in the dry and tempered sand and find them all content. And now, what shall we feed? First, and better than all things else, feed dry crumbled wheaten bread. The second day feed warm sweet milk and bread; alternate these two feeds with bread thus crumbed and mixed in equal parts with hard-boiled eggs; continue in turn, and add to these, after the first three days, crushed wheat, fed dry—especially this at night. Milk curd—well drained—at any time is elegant, but bear in mind that chicks do best on frequent change from each to every other diet here prescribed. Feed sparingly and often, and early in the morning. For breakfast give them warm beef soup, peppered and mixed with bread. It is best to make this soup the afternoon before. Place one or two beef heads, cut up in chunks, in some convenient cooking place, and allow three buckets of water to each head, and thus you have six buckets of soup and the tender meat, which will last a long time and cost but ten or fifteen cents. Potatoes may be boiled with this, thus making the finest morning meal, hot, generous and far healthier than anything nature ever offered. After the first ten days, whole wheat and corn, crushed fine, either with any or all the other food, or fine crushed corn, fed dry, and wheat, will carry them fast and finely on.

Boiled eggs, too freely fed, will constipate and kill young chicks, and must be mixed with bread. Sour milk is safe and fine for young chicks ever after the first ten days. Never feed a chick or fowl *cornmeal dough*. It generates the gapes, either through fermentation, indigestion or some other unknown way; it breeds and brings about myriads of long, red and crooked little worms, which fill their little throats and choke the young chicks to death. *Dampness* and *dough* will always do this work. I think these wicked little worms

are children of innutrition. As festering wounds imbed the ova, and so bring forth bacteria; as corn too long and freely fed to hogs, exclusive of other diet, startles mankind with all the perils of trichinia; as corn bread breeds the lumbricoia and other worms in childhood, so *dough*, when fed to chicks, engenders irritative indigestion; and membranes thus diseased afford a tempting nest for floating atmospheric fungi—the smallest forms of unseen animal existence—whence the ova breed and bring forth bacteria and kindred kinds of all the interminable train of crawling insect life. Feed all food to chickens *dry*. Avoid all dew and damp and cold wind, and remember that innutrition is the essence of all disease, and that every epidemic since the world began, either with poultry or with man, had its start and gained its impulse and power in *famine and filth*. Be clean, and feed as herein taught, and nature's claims are met, and scarcely a chick will die.

If you



at the old methods of farming, or if your fruit and stock investments do not give ample returns, why not try your hand at poultry culture? It is a pleasant and profitable calling, and the Reliable Incubator & Brooder Company, of Quincy, can furnish you with a perfect equipment for every department. Others have been successful in this line, who not you? It is well worth a trial.

How to Caponize.

What are Capons ?

CAPONS are aptly termed the "finest chicken meat in the world," for there is nothing growing feathers, their equal or superior. A capon is neither rooster or hen—it is nothing else than a *capon*. After removing the testicles from the cockerel, its nature becomes entirely changed. They take on a more rapid growth, are more tame, awkward in carriage and always exceedingly lazy, take on a very heavy and beautiful plumage, the comb and wattles cease to grow, the spurs do not develop as in the cockerel, and being cast off by both rooster and hen soon show a fondness for the society of little chicks. To these they will act as mother, covering them with their heavy plumage at night or leading them about during the day. In France this is extensively practiced, the capon taking the place of the mother in rearing chicks, while the mother, unfettered by the cares of her feathered family, becomes a layer only. France is the foremost nation on the globe for bringing much out of little. That they universally practice caponizing is a proof of the large and successful results to be derived from this operation. The *Rural New Yorker* says:

"The flesh of capons is decidedly sweeter and of finer flavor than that of cocks. They gain from two to four pounds in weight, while the cost of feeding is no more. If the farmer could once get a taste of capon, there would be a great reduction in the number of roosters on his place. After capons have once been introduced into a market, there will be a great demand for them. Any large breed will make fine capons. The operation can be performed at any age, but from two to six months gives the best results. I do not see that the birds suffer any pain after the first incision. They lie motionless unless you touch their heads. To show how little people in general know about caponizing, I can relate a fact

that came under my observation. At a poultry farm where I was visiting, a lady called and examined some capons. When told what they were, she said they were splendid birds, and asked the proprietor to be sure and send her a setting of their eggs. It made considerable laughter after her departure."

Caponizing.

There is always a pre-eminent object in departing from the ordinary, and caponizing has this object. The wise farmer, looking to assured future profit, sees far more weight in the steer than in the bull. Castration makes the wonderful increase, and in just the same proportion does this apply to the cock and capon. In poultry raising (as in all other enterprises), the most successful results from certain lines are aimed at, and it is over the threshold of this highly important point that the capon has stepped, opening up certainties never before dreamed of by the most sanguine. "What shall we do with our cockerels?" has ever been a perplexing question to the poultry raiser, as in a great many of the settings hatched, the male predominates. Chasing about the yard, worrying the hens, continually spoiling for a fight and cutting all kinds of capers in general, the cockerel loses his flesh almost as rapidly as gained, displays a voracious appetite, and in the end proves the cost of keeping to be far more than the price he brings in the market. This is very discouraging to the poultry raiser, and after a careful figuring of accounts he considers the "game hardly worth the candle."

In caponizing, all these troubles are swept away—the erst-while fighting cockerel becomes docile as a chick. Instead of chasing about the yard, he keeps his own company and spends each day in quiet living. Without the draw-back of physical exertion the flesh rapidly increases, the bones add weight to weight, and where, under the old way, a farmer would kill an ordinary looking cockerel of but little weight, he now dresses for market a bird rivaling the turkey in size and weight, whose flesh in flavor is superior to that of the spring broiler and as tender and juicy. Caponizing solves the problem of disposing of a large number of cockerels whose diminutive sizes are small inducements to the dealer. Caponize the chicks and you have at once laid the foundation for a handsome profit in a short time to come. Outside of the cardinal points of profit, the simplicity of the operation (when

proper instruments are used) recommends itself to everyone. A boy ten years old can readily perform the operation, and everyone can soon become expert.

Profit in Capons.

To the poultry raiser we would say we know of no source of profit bringing larger returns for the outlay than raising capons, the profit in a great majority of cases being over 100 per cent. The question of assured profit is an all-convincing argument in any line, and pre-eminently so to the poultryman whose losses are added to from various unlooked for sources. As an illustration : Ordinary dressed poultry in the market will bring from ten to fifteen cents per pound. Capons readily sell from twenty to thirty cents per pound. When we take into consideration that their cost is no more—even if as much—than the cockerel we readily see the enormous profits derived from caponizing. Not many years ago the practice of caponizing was very little known in the United States. To-day it is extensively practiced among poultry raisers throughout the country, a growth convincing in itself of the great profits derived therefrom. We have given this matter of profit close attention for a long time and find the results in all cases highly satisfactory. It is now an established fact that equally as fine capons can be raised in the north, west or south as in New Jersey. They can be successfully grown anywhere. New Jersey being the pioneer state in which capons were raised in this country, and owing to the fame attached to the bird, this has given that state an enviable prominence to outside poultrymen. Now, nearly every state sends its capons to market. The live poultryman is not slow when looking to his best interests.

Large Demand for Capons.

The better a good article becomes known the greater the demand, and capons are no exception to this rule. It seems impossible to meet this demand. As the practice of caponizing grows and as the birds come to market in greater numbers, in greater proportion the demand increases. In February and March it is hard to find a capon in the market. This should not be, particularly when it is possible to have them at any time in the year, and when the supply falls far

short just at the time when it would seem that other poultry could take the place of them. This conclusively shows what a field is open to the capon raiser. February and March is the season of the year when most capons are placed on the market, and yet it is hard to find them there. The reason is quite obvious—they are caught up at once at large prices. Ordinary chicken meat has no show with the capon. The public is fast learning this fact, and where a capon is to be had no other fowl will suffice. This causes all far-seeing poultry raisers to put on their thinking-caps with the result that they at once begin to cater to this demand, increasing their income 100 per cent thereby. The field is open to everyone. You can do it. Have you tried?

Philadelphia Capons.

On the bill of fare of the finest hotels, not only in Philadelphia, but throughout the United States and Canada, may be seen this item, "Philadelphia capons." That the bird is so designated, does not for one moment mean that Philadelphia raises all the finest capons. There always has been a great demand for capons in that city—a demand far ahead of the supply. The neighboring poultry raisers and those for miles around have been quick to see this, and their birds have poured into that market. Philadelphia has had almost exclusive control of the capon market in that section, all shipments being made to that point. Hence the name of "Philadelphia capons." Philadelphia was the pioneer city for raising capons, and as the fame of the bird spread, it naturally took on the name of its marketing center.

Directions for Caponizing.

From twenty-four to thirty hours before performing the operation select such cockerels as you intend to caponize (these should be from two to four months old), confining them in a clean and airy coop or room without either food or water. The best time to confine them is at early morning, as their long fast will then end about noon of the following day, at which time the operation is best performed. Should the day be cloudy or wet, do not caponize them, but let the operation go until you have a bright and fair day. It is necessary that you have all light possible in the matter. If it be a

cloudy day, and you decide not to caponize, the birds may be given a little water and food if necessary, but it is much better to avoid this if possible, as it is very desirable to have their intestines quite empty, thus allowing their testicles to be more readily seen, besides giving the operator much more room in which to perform his work. Lay the bird on the operating table (this table is fully described elsewhere in the



Fig. 1. Cords for holding fowl.

book) on its left side. Wrap the cord Fig. 1, twice around the bird's legs above the knees. In making one wrap only there is danger of the bird's kicking themselves out of the loop. Hook the other cord once around *both* his wings close to the body. To the opposite end to these cords attach a half brick or some equal weight letting them hang over the sides of the table. This holds the bird securely. Have all your instruments in readiness that you may work quickly. Thread the canula, Fig. 5, with a strong and long horse-hair or fine steel wire (we think wire the best) letting the wire form a loop at the curve end and well out at the other end. Now,



Fig. 2. Knife for making cut.

after slightly wetting the spot, proceed to pluck the feathers from the upper part of the last two ribs and just in front of the thigh joint. Pull the flesh on the side down toward the hip, and when the operation is finished the cut between the ribs will be entirely closed by the skin going back to its place. While holding the flesh back with the left hand, with the right hand take the knife, Fig. 2, and insert it (cutting-edge away from you) between the last two ribs, cutting first down and then up a little ways, following the direction of the ribs, making the cut not over one inch long. Cut deep enough to go through the skin and ribs, being very careful not to go so deep as to cut intestines. There is little danger of doing this, however, if they are empty, as they will be from the bird's long fast. The danger of cutting the intestines is when they are full, as in this state they press against the ribs. Should

the cut bleed, stop a moment, let the blood clot on the thin skin covering the bowels, and then remove it with our curved spoon forceps.

Now take the Improved Spring Spreader, Fig. 3, press it between the thumb and finger until the ends come together, inserting the ends in the incision with the spring end toward the bird's feet (see operating table, page 76). Upon look-

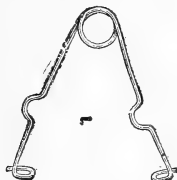


Fig. 3. Improved spring spreader.

ing into the cut a thin tissue-like skin will be seen just under the ribs and enclosing the bowels. Take the sharp hook, Fig. 4, and pick the tissue open so that you may get into the bird with the instruments. The breaking of this skin does not cause the least pain to the bird. One of the testicles will now be brought plainly to view lying close up to the back of



Fig. 4. Sharp hook to open film-like skin.

the fowl. Sometimes both testicles are in sight, but this is not generally the case, as the other one lies beyond and more on the other side of the bird, the intestines preventing it from being seen from this opening. The testicle brought to view is enveloped in a film. This should be brought away with the testicle. Some people in caponizing tear the skin open and then take the testicle out. The danger in so doing is that if this skin is left there is danger of causing a "slip."

Now comes the only dangerous part of the whole operation—getting hold of and removing the testicles. But with a steady hand and plenty of light not one bird in a hundred should be lost. Attached to the testicle and lying back of it is one of the principal arteries of the fowl and this, if ruptured, is sure to cause death. It is here that our improved canula, Fig. 5, proves of the greatest advantage. The hair

(or wire) being small and very fine, is easily slipped between the testicle and artery without injury to either, a clear, clean cut made that no other instrument can do. Take the canula



Fig. 5. Pilling's improved caponizing canula.

in the right hand and adjust the hair (or wire) in it so that a loop about one-half inch long will extend from small end of tube, leaving the two ends of wire extending far enough out of the open end to secure a good hold. Insert the end of tube that has the loop on it very carefully and slip the loop over both ends of the testicle and entirely around it, hold end of tube *close down* to the testicle. When the testicle is entirely encircled by the loop, take both ends of wire (or horse hair), which come out of the other end of tube, with thumb and first finger, holding it tight, and draw up on it carefully but firmly, being particularly careful to have loop around testicle. Keep end of tube very close to testicle all the time. If drawing up on the wire does not at once cut testicle, slightly turn from one side to the other (but not entirely around), then the testicle will come off. After removing it, carefully examine inside of bird to see that no piece is left in, and also to see that no foreign substance, such as feathers, etc., has gotten in. If there have it is necessary to remove them, for if allowed to remain they are liable to cause inflammation. Sometimes a feather or part of the testicle may drop among the bowels. If this occurs, move bowels around with probe, Fig. 6, until the object is found, then remove with curved spoon forceps. When the operation is performed remove the



Fig. 8. Caponizing Probe.

spreader at once and the skin will very soon slip back over the cut and heal in a short time. Never sew the cut, as it will heal just the same as any other small flesh wound.

The bird can now be turned over on its right, cut made and testicle removed in exactly the same manner as just described for the left side.

Both testicles may be taken out with one incision, but to the learner we would say this is attended with more difficulty than the two incisions. The other testicle being situated so far on the other side, there is more difficulty in reaching it, besides the danger of piercing the artery running back of first testicle. To an experienced party there is no danger in removing both testicles from one incision, but to those who have not that degree of confidence given by practice we would recommend the two cuts. The bird recovers just as quickly as though one cut was made, and the operation is performed equally as quick, if not quicker. If both testicles, are removed from one cut, *the lower must always be taken out first*, for if top one is first removed, the small amount of blood that may follow will cover lower one, keeping it from view.

Our improved caponizing canula is the only instrument of its kind that will successfully use either wire or horse-hair. Owing to the strength, durability and stiffness of wire, we find it much more preferable than horse-hair. We include two coils in each set of our caponizing instruments. It is very fine, tempered steel. These wires we will furnish extra at any time, price five cents each.

All cockerels as soon as caponized should be marked, so that a record may be kept of them. (See our poultry marker, page 82).

Best Time to Caponize.

Fowl hatched early in the spring make the finest capons. They can be cut before hot weather comes, which is a great advantage, although no ill results follow the operation at any time in the year. The bird should be from two to three months old (not over six months) and weigh not less than a pound to a pound and a half. The size is equally important as the age. June, July, August, September and October are the months generally taken for caponizing, for the reason that spring chickens arrive at proper age and weight during these months, also because cockerels caponized then arrive at the proper age and weight for market during

the months of January, February, March, April and May, at which times there is the greatest demand for them in the cities and the highest prices are secured.

That capons are in our markets at certain seasons only, is because the demand is so far in excess of the supply. The time *should* and soon *will* be when capons may be obtained the year around.

All cockerels not needed for breeding purposes should be caponized after reaching the age of two months. Do not try the operation on too young chicks, as their organs are then so small and undeveloped that you may either kill or cause a "slip." The age already given is the proper time.

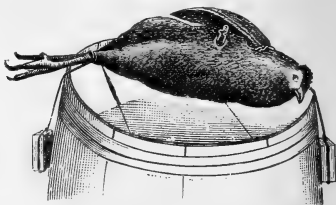


TABLE No. 1. The above, photographed and engraved from life, illustrates method of holding fowl ready for caponizing.

Operating Table.

There are numerous styles of tables on which to caponize, but experience in this matter places our choice between two only.

The top of an ordinary barrel (see illustration) meets all requirements as a table, admits of the bird being easily secured, brings the bird to a proper height with the operator, in brief makes as good a table as can be desired. It costs nothing, as there is always an empty barrel lying around, or one that can be easily emptied.

The second illustration shows how a good caponizing board (or table) can be constructed by the use of our improved staple A to slide over the wings of the bird. The staple has two fenders about one inch from the points to prevent forcing the bird's wings too close together, as would be the case without them. The cross-bar on staple allows you to use the

upper part for a handle. This will be found very convenient during caponizing. One point of staple is longer than the other, this enables it to enter the board much easier. By cutting six or seven holes in the board it will take any size bird. B is the strap loop with a pin across the top to prevent strap from falling through the board when not in use. C is the weight at the other end of strap for keeping feet down.

This table is very good for those who propose caponizing on a large scale. The entire construction, as shown in illustration, is very simple and easily made.

For those, however, who do not propose caponizing on an extensive scale, we would recommend the top of a barrel. Whichever method is used, make it a point to have plenty of sunlight and the table so situated that the light will strike squarely on the fowl. You cannot have too much light during the operation.

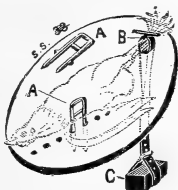


TABLE NO. 2. Can easily and cheaply be made. Is suitable for those who intend caponizing on a large scale.

Killing and Dressing Capons for Market.

Capons should be allowed to grow until at least one year old. By this time they are a beautiful bird and will have attained an imposing size. Some keep them even longer than a year. While this is optional with the raiser, yet, we would not advocate killing them *under* one year if they are being raised for market.

There is a great difference between the dressing of capons and an ordinary fowl. Some writers enlarge in a very gilded manner on this process. We shall endeavor to place the operation before you, shorn of all unnecessary adornment as to useless words. When the capons are ready for market, select such as you propose killing and confine them. Keep

them without food or water for about twenty-four hours before killing, that their crops may be entirely emptied. Now get ready your place for killing and dressing the fowl (if you have conveniences in the chicken house this will do quite as well, or the wood-shed, or any cool out-house), and drive two heavy nails or wooden pins about one foot or less apart in an over-head beam. Make two nooses of strong string, each noose long enough to hold one each of the legs and have the capon hang low enough to pluck with ease. Have a weight of two or two and one-half pounds attached to a hook, and when the bird is killed, fasten this hook in his lower bill after you hang him up for plucking. The weight holds the bird in position while picking and renders the operation much more easy.

Next procure a table to dress the fowl upon, and make a frame on the same principle as a small box without the ends and cover. In this you lay the capon back down to remove the intestines.

When everything is in readiness take your capon and suspend him by the two legs from the nooses. Catch hold of his head and with your French poultry killing knife cut vein at back of throat through the mouth. Never cut this from the



French poultry killing knife.

outside. Immediately upon cutting vein run point of knife through roof of the mouth clear into the brain. This operation causes what is termed "dropping the feathers"—making them come off very easily. As soon as the knife enters the brain the bird loses all sense of feeling. Begin plucking at once.

Now, the style of dressing: The feathers are left on the wings up to second joint, the head and hackle feathers, also on legs half way up to drumsticks, all the tail feathers, including those a little way up the back and the long feathers on hips close to tail. These feathers add greatly to the appearance of the bird when dressed, and are also a ready marker from other fowl in markets. Never cut the head off, as this is a distinguishing feature of the bird. A capon may readily be identified among a thousand cockerels, as the comb and wattles of the former ceased to grow immediately after caponizing was performed. Wash head and mouth well with

cold water, being careful to remove all blood. A capon should not be torn in plucking. There is no danger of this happening if proper care be taken. Now, take weight from the bird's mouth, and place him back downwards in the box frame already described. Cut carefully around the vent and pull out the intestines. These will be found covered with fat, which, as they are pulled out, should be pushed back. When the end of the intestines is reached, run your fingers up in the bird and break them off, leaving everything else in. As may be expected the fat will be found very heavy around the opening, and if slightly turned outward will soon become hard, which will give a very rich appearance to this portion of the bird. Let the birds hang in a clean, cool place until thoroughly cold. For packing use a new box of the required size, lined with white paper (any good clean paper will do), pack the birds in solid, back up, being careful not to bruise them. Your birds are then ready for market. With a bird not torn and the feathers properly left on, you have a fowl that for inviting and "taking" appearance it is impossible to equal.

All Poultry Raisers Should Caponize.

Every poultry raiser has a useless number of cockerels running about his place. We say useless so far as any certain degree of profit is concerned. Often (simply owing to their number) these cockerels are killed for the home table. This offers *one* solution of their reduction, and is quite proper. But when we stop for a moment and think that the poor little cockerel just killed, scarcely tipping the beam at three or four pounds, and representing 25 per cent more in feed and care than his worth—when we think of it that this same bird caponized would cost no more, if as much, would have more than doubled his weight and engendered a fat, juicy and tender flesh, it is an unanswerable argument upheld by the bird himself that all poultry raisers *cannot* afford to do otherwise than caponize, and this argument is just as convincing for the table as for the market.

Caponizing makes fine birds from common stock; makes birds twice as large as, and double the weight of, ordinary fowl with the same amount of food, and turns the otherwise useless number of cockerels into a large source of profit.

Feeding Capons.

The question is often asked: "How are capons to be fed?" The answer is easily given: After caponizing give the bird all he will eat of soft feed, and let him have plenty of water. Caponized fowl begin to eat almost immediately after the operation is performed, and no one would think for a moment that a radical change had been made in their nature. Now leave the bird to himself, as for the time being he is his own doctor. It is well to look him over two or three days after the operation, as in breathing, the air sometimes gets in under the skin causing "wind puff," or a slight swelling, in other words. Simply prick through the skin at sides with a sharp needle, gently pressing at the same time, when the air will be expelled and the capon relieved. Within ten days from the operation it would be difficult to find where the incisions were made. A day or so after caponizing the bird should be allowed to run at large, treating him just the same as any growing poultry would be treated.

Caponizing is Not Cruel.

A large number of persons hesitate in caponizing, feeling it to be cruel to the bird. To these we wish to bring our experience in this matter proving to the contrary. This is a greatly mistaken notion and the operation bestows an unlimited amount of kindness on the bird, even if there were no other considerations or returns. The writer has seen cockerels fly at one another time and again, tearing flesh and feathers with beak and cutting with spurs. Before the combatants could be separated there has been a disfigured comb, probably a blinded eye and a generally cut-up bird. This is the essence of cruelty.

After caponizing, the habits of the bird, as already noted, are entirely changed. The disposition is quiet and peaceable, habits mild and tending to a solitary life and perfectly contented wherever situated. They no longer chase about the farm spoiling for a fight and running off flesh as fast as put on; they no longer arouse the whole neighborhood from morning until night by their incessant crowing, but, on the contrary, become models of good disposition, leading a quiet life that will surely bring large returns to the raiser. An operation that does away with so much inborn evil cannot be considered cruel.

"Slips."

With the proper instruments and care this term should not be known. But so many beginners allow themselves to be hoodwinked by unscrupulous traffickers in cheap and common so-called caponizing sets that it seems impossible to avoid this result.

A "slip" is neither capon nor cockerel. He is much inferior to the former and a great deal worse than the latter. The "slip" is caused by not entirely removing the testicles. The smallest fraction left in the bird will grow again, with no benefit to himself, but rather a great trouble, as he incessantly chases the hens, and while not a fighter himself becomes the cause of numerous broils.

Our improved caponizing canula makes the "slip" an impossible factor, as, owing to its construction, it causes the loop to fit closely and completely around the testicle and when the wire is drawn up cuts off the testicle clear and clean. It is impossible to get the same results from any other instrument. In using forceps or twistors of any kind there is always great danger of both tearing the testicle and artery. If the former, your bird is a "slip;" if the latter, your bird is dead. All danger is removed when our improved canula is used [see Fig. 5, page 74].

Points for the Learner.

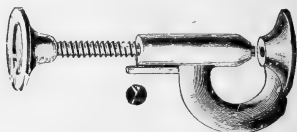
Our first advice would be, "Keep cool and make haste slowly." If you are rather too tender-hearted read the directions over carefully and then try your hand on a dead fowl. All surgeons do this in the first place, and probably it would be as well for you to follow their example. Have plenty of light. It is impossible to properly perform the operation unless you have this. Do not get nervous; you are not giving the bird one-half as much pain as you are giving yourself uneasiness. Have your instruments all in readiness, secure the bird properly, make the incision, insert the spreaders, pick open the film-like skin covering the bowels, and go on in the operation with your thoughts entirely on it and not on the bird. After your first performance of caponizing you will be surprised at its simplicity, and, instead of being a learner, will find that you have gained the lesson. Be very particular to see that your instruments are first-class, as the market is

already being flooded with a cheap and worthless lot of caponizing instruments. It surely must be that such unscrupulous dealers are blind to the fact that they cannot sell a second set in the same locality. Else they are satisfied to make all they can out of the first deal. Always keep your instruments in perfect order. Before using the knife see that the edge is sharp, and that the other tools are as they should be. After beginning the operation of caponizing there should be nothing to hinder you from going right ahead. Use plenty of good common sense. This is an indispensable quality on any point. After caponizing once, or probably twice, you are a learner no longer, but master of the situation. There is no reason why everyone who reads this work should not be able to caponize properly. To this end we have made it simple as possible, and yet at the same time sufficiently explicit and exhaustive.

The pre-eminent question asked by the learner, is "How long does it take to caponize a bird?" We would reiterate our first advice: "Make haste slowly." The first operation may take from fifteen to twenty minutes, but take your time, go slowly and act quickly, note every point, keeping your thoughts intently on the work. The first operation is your instructor; the second finds you master of the situation. After a little practice a bird can be caponized in two minutes with a good set of caponizing rods.

Mark Your Capons.

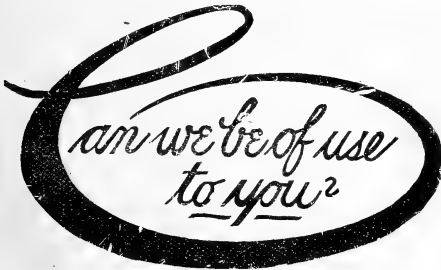
If you breed fine poultry mark every bird. This little instrument, used to punch web between toes, is invaluable to the poultry-raiser in marking young and old chickens, capons



and all kinds of fowl. This marker enables every farmer and breeder to recognize their own fowl at a glance. The marking can be made in over 200 different ways, and this number can be still more added to by marking the skin of the wings. The

eggs are marked according to the breed. As soon as hatched the chicken marker names your chick for you, and you can tell it anywhere.

Having your own mark for your chick it is impossible to lose it anywhere, as the mark on the bird proves the owner at once. It also enables you to tell the age and every detail in reference to it. These markers are made in two sizes, for large and small chicks, are nickle plated, have steel cutter and spring, making a small and neat instrument that can be carried conveniently in the pocket. Sent by mail, postpaid, price 25 cents each.



Do you not think the question of "Raising Poultry for Profit" is solvable on the line of modern improvements? Do you need anything in the line of incubators or brooders? If so, the Reliable Incubator & Brooder Company will give prompt and careful attention to all communications on that subject, and are thoroughly qualified to offer practical suggestions on all points of artificial incubation.

The Most Profitable Poultry.*

BY J. H. DREVENSTEDT.

THE value of thoroughbred poultry to the farmer is fully as great as that of thoroughbred stock of any other kind. It costs no more to keep, brings better prices, and is altogether more profitable than common barn-yard stock. When I first engaged in farming little heed was paid to the hens. The farm, the garden, the cattle and horses were carefully looked after with an eye to profit, but the hens were a side issue. The flock was mixed, and was of no particular breed, and the eggs and dressed poultry were like the flock—mixed also. There was no uniformity in the product, consequently it sold in the markets as ordinary produce. That means ordinary prices and little profits.

Like all young poultrymen, I bought eggs and fowls of many different breeds, and while I never regret the experience gained in breeding half a dozen different varieties at one time, I soon discovered that a farmer has no time for such expensive fancy poultry farming. I then selected the breed that I liked best and determined to go in for profit. The five years during which I kept stock on the farm convinced me thoroughly that poultry culture was a very profitable thing. A ledger account showed that the hens paid far better than the dairy cows, both products being sold at good prices.

It is commonly supposed that thoroughbred birds are of no account for practical purposes, being bred simply for fancy points. This is true only so far as the management of the birds is concerned. A fancier does not care for egg records, but believes in feathers only. He pays the price, and it is a large one, to obtain a desired "point." He pens up his birds, he breeds them in-and-in, he "conditions" them for

* By permission of Rural Publishing Company, New York.

the show-pen, and the natural results are fine plumage and often delicate and unprofitable birds. Such a course has killed a number of fine breeds for profitable purposes.

The selection of one breed means a uniform flock of birds. Such a flock attracts the attention of neighbors and visitors, especially if well kept. The eggs being from one breed, are, as a rule, uniform in color, which enhances their market value; the broilers and dressed carcasses are uniform in color, and if well fattened bring the top prices. The thoroughbred trade-mark is there. Eggs can be sold for hatching purposes to neighbors at an advanced price, and the demand for thoroughbred cockerels in the fall is another source of revenue.

The farmer will naturally be puzzled to select the best breed for his purpose, for in these days every breed has its strong champions, and there are scarcely any poor ones, if we can believe all we read. A farmer must always bear in mind what his market desires, and whether he can profitably sell eggs only, or both eggs and meat; on this depends the selection of breeds. In New Jersey many farmers and practical poultrymen select fowls that lay white eggs, because the latter bring higher prices in New York city and Newark markets. The Leghorn is the favorite, and it is doubtful if there is anything in the whole poultry kingdom that can exceed the Leghorns in their large and valuable egg product. It is true that there are other breeds that lay white eggs, such as the Minorcas, Andalusians, Polish, Houdans, LaFleche and others, but, excepting the first two, they will not lay nearly so well as the Leghorns. The Minorcas and Andalusians lay very fine white eggs and plenty of them, but the edible quality of their meat is not prized in our American markets because of the black shanks and white skin that belong to these breeds.

The great success of one noted firm of poultrymen is due largely to the fact that they keep only one breed, and that the White Leghorns. While they do a large business in selling fowls and eggs for fancy purposes, yet the flock they keep turns out a large revenue in the sale of fresh eggs. Another point in favor of the Leghorns is that the surplus cockerels when killed as broilers and spring chickens make handsome carcasses that sell well in our markets. White eggs that are absolutely fresh will average over 35 cents per dozen during

the year. They retail in New York city at from forty to seventy-five cents per dozen, according to the season and the location of the market. There is little difference in the laying capacities of the different varieties of Leghorns, but for practical farm use I would prefer the whites. Another advantage is the wonderful fertility of Leghorn eggs. They always hatch well, and are especially adapted for hatching in incubators.

Where eggs and meat are desired, I pin my faith on the Wyandottes and Plymouth Rocks. Both breeds are fine winter layers, and if the eggs are carefully selected for hatching purposes, a strain of fowls will result that produce a fine lot of uniformly brown eggs. I could always obtain as much for brown eggs as for white, but my markets were the special customers in the city who simply desired clean, fresh eggs. The best way to handle these breeds is to sell the eggs from September to March, when eggs are high in price. Begin in the month of January to set eggs for early pullets. The latter will commence laying in September in time to supply an active market. I generally continue to set eggs up to May 1, when I sell off the surplus old hens, keeping only the finest ones for breeding purposes the next winter. By using eggs from two-year-old hens for hatching, better stock will result, as a rule. The first lot of chicks will contain many cockerels that can be profitably sold as broilers, but in all later hatched chickens, the cockerels had best be allowed to reach four to six pounds before they are sold, as the demand for such roasters is always good, especially after August, but not later than November. From November to January 1, the general market is apt to be flooded with poultry.

In regard to handling thoroughbred fowls for laying, I always pen them up, usually twenty to twenty-five in a pen, in a yard of 50x20 feet. More eggs can be obtained in this manner than if the fowls are allowed their liberty. The pens for breeding usually contain ten to twelve hens, mated to one cockerel, and if possible they are allowed free range. The laying hens need no male. The hens in the laying-pens that are to be kept over for another season are turned out into pasture after May or June, and fed oats or buckwheat once a day. Forcing for eggs throughout the summer from hens that laid during the winter will retard the moulting, and too much "dead timber" in the fall and winter will be the result. Hens

allowed to pasture and not forced with grain will moult out nicely. I remember that all my Wyandottes moulted by November one season.

In raising thoroughbred chickens, whether by natural or artificial means, the great point is to follow closely nature's methods. A hen with her brood on a nice shady grass-run will bring up strong chickens. The brooders are artificial mothers, and except in the early spring months must be outdoors, where the chickens can have a good range. During January, February and March chicks do well enough when raised indoors, but as soon as the temperature gets over 60 degrees, the sooner they get outdoors the better. This especially applies to Leghorns and other quick-feathering breeds. Deprive the latter of a good range, and poor and sickly chickens will be the result.

There are numerous other excellent breeds, notably the Light Brahmas. The latter, in the hands of such skillful breeders as James Rankin and I. K. Felch, bring large returns. The Langshan is a fine fowl, is a good layer and has fine meat, but the black legs and the white skin do not take in the general market. In a fancy market, however, the Langshan has many admirers. One dealer in Fulton Market, New York, has informed me that he obtained extra prices for their carcasses. The Indian Game has unquestionably the finest breast development of any fowls I am acquainted with, and looks meaty and appetizing in every way; but it has not been sufficiently tried in America to enable one to estimate its practical value. Properly selected and bred, it should reach the top notch.

Pure Bred Fowls.

The question is often asked, Are pure bred fowls any better than the common or mixed sorts which we find on most farms, and if such is the case why is it so? In every case where fowls receive proper care and attention, the results produced show a marked difference in favor of pure bred varieties. The reasons why this is so are easily explained. They are on the average much better layers; they lay larger eggs and many more in the course of a year than the common barnyard fowl; they are also superior to common stock for raising chickens for market. Of course, in mentioning a first-class fowl for market, we mean some of the most popu-

lar varieties, which are best adapted to that purpose, such as the Plymouth Rock or Wyandotte, as they produce chicks of uniform size, with yellow legs and bodies, which are preferable to the consumer to the common breeds, which produce chicks of all sizes, and legs and flesh of various shades of color. Again, pure bred fowls are certainly more pleasing to the eye than a flock of inbred mongrels, as each variety has a distinct color of plumage, which makes them very ornamental to any yard or lawn, if they are bred according to the requirements of the standard, and they will also sell for a better price to those who wish to procure a choice stock to breed from. In selecting a variety that will bring the best price in market, it is very essential that they should have clean yellow legs and bodies and good size.

The Common Hen.

We wish to take up the subject of common hens in order to oblige a large number who often make inquiries as to the relative merit of the common stock and pure breeds. In the first place it is no easy matter to define what may be called a common hen. Sometimes common hens are the best of breeds, as they combine the good qualities of several strains. The Brahma hen, which lays so well in winter, may be slow in growth and late in maturing, and when bred too close, through relationship, may fail to give satisfaction. The breeder of such fowls will perhaps turn them out to run with roosters of no particular blood, and the result is a mongrel half Brahma and half *anything*, as the case may be, but the Brahma blood is there, and tells in the common stock, which receives the credit for excellence that belongs to the Brahma alone.

One of the best illustrations is to notice the influence of the Houdan. If this breed is crossed on any kind of hen the best qualities of the Houdan seem to be prominent and the crest and toes (five) will crop out for successive generations, even when bred away from the Houdan for five or six years, the Houdan blood not being more than the one-thirty-second part, and yet it is to the dunghill fowl that the credit for egg production is allowed, while the honors gained by the top-knotted hens which show their remote origin to the Houdan, should properly be ascribed to that source. Again, mix a flock of fowls indiscriminately, common or pure breeds,

and allow among them a Langshan cockerel, and every black hen will begin to lay early for the large kinds, which means that the Langshan blood is a great improvement; but because the fowls were not kept as pure breeds they will be classed as common kinds and made evidences in favor of the claim that pure breeds may be good, but *common* fowls are better.

Crossing fowls imparts new life and greater vigor when they are closely bred, yet crossed fowls are not necessarily common, but they are so styled, though it is safe to say that there is not a flock of fowls known that has not been improved to some extent by our pure breeds, which have been so widely disseminated. Does any one doubt that the Leghorn, which is one of the purest of breeds, lays better than any other, or can anyone answer why common fowls are not uniform in other respects as well as laying? Are any two common fowls exactly alike? They should be if they possessed fixed qualities, but the fact is they have too many different strains of blood in them. There are the Brahma, Leghorn, Houdan, Plymouth Rock, Hamburgh, Langshan and Cochin crosses, which give egg production, but prevent uniformity of plumage.

The pure breed is the best for all purposes, and until the common flock is seen that does not prove the excellence of the pure breeds, it will not do for the advocates of common fowls to attempt to disparage breeds that unerringly stamp good qualities on every flock to which they are united.



Who have used the Reliable are enthusiastic in sounding its praises, as the hundred of letters received testify. We furnish substantial proof from our patrons that our machines are fully as represented, and our aim is to furnish the best incubators for the least money. Our special desire is to make every Reliable Incubator sold a profitable investment for the purchaser and a testimonial of merit.

Facts in Poultry Culture.

BY D. T. HEIMLICH.

POULTRY culture to-day is having more attention given to it than any other industry. While it is still considered the small end of farm products by the greater majority of the tillers of the soil, they are forced to recognize it as the main factor from which the actual living of the family is derived. The day is past when the reading and intelligent farmer says in a depreciating tone of voice, "chickens are good enough for the women folks to fool with." Every intelligent farmer to-day takes care that the women folks have good stock, well knowing that if the "women folks" get half a chance they are very likely to make a success of it in providing eatables and other things with the chicken and egg money, which the "lords of creation" would not provide if the cash had to come out of their own pockets. There has never been such a demand and never so many fanciers and breeders in the history of the world to supply the demand for good stock as at the present time. Poultry papers by the score, old and new ones, all helping and aiding the poultry public to grow rich in poultry knowledge and add to the ranks of the fancy from which the farmer and market poulterer must get his supply of new blood wherewith to improve his flock, ever aiming to get better every year, thereby creating a demand for what he or she has to sell not only in their own neighborhood but from abroad. It will take but a few years until the demand will be greater than the supply. I know of several breeders in our country who raise from one hundred to three hundred chickens, which go like hot cakes, at prices that are never less than double what they could bring in market. I know of a girl eighteen years old, who last year sold over sixty-five dollars worth of poultry in market and had a fine flock left from which she

had twenty females selected as fancy, properly mated, from which she raised over three hundred head, one-half of which can readily be sold as high-class poultry, the other half as breeding stock to people who are not fully in favor of paying what they term fancy prices. This class, if they will read up good poultry papers, will become fanciers and breeders and will not hesitate to pay reasonable prices to the breeders and fanciers who have spent time and money to acquire as much knowledge and learning as books and papers can impart along this line of study. I know of three other lady breeders who each raise one and two hundred Buff Cochins and Light Brahmas every year and never have enough stock left by the first of March to supply half the demand. I know of one farmer who raises from two to three hundred Light Brahmas every year and has had none to spare after December 1st. in the last five years. He disposes of them at six to nine dollars per dozen, does not select them carefully in making his matings, puts five or six good males with sixty hens and turns them loose on his farm; has no ambition along this line above disposing of his surplus at a small profit. These kind of breeders are little or no benefit to the true fancier, for the chances of a number one specimen by such careless matings are small. Ten or fifteen dollars would buy a house and enclosure large enough to accommodate ten or twelve choice specimens, which if carefully selected and mated would breed him ten extra choice specimens where he now takes the chance of getting one, and that one would be an accident whose breeding could not be relied upon. In two years of such careful selection he could have a flock to equal the number he now retains and all be first-class specimens, from which he could sell specimens at prices that he now sells a half or a dozen at. Don't breed poultry on this plan, dear reader. If you have not got the money to buy a dozen first-class breeding birds, buy a half dozen or a trio. Pay a reliable breeder a fair price for good birds, properly mated, for best results. Raise as many as possible from them, give proper care, learn what the standard requirements of the breed you have should be, do not expect all to be good enough to breed from, but select the best. If you cannot do that get some one who has had experience to do it for you. Avoid breeding disqualified birds and in due time success will crown your efforts and your love for fine poultry will grow.

Names of Different Breeds.

BLACK Cochin, Buff Cochin, Partridge Cochin, Pea-comb Partridge Cochin, White Cochin, Dark Brahma, Light Brahma, White and Black Langshan.

Crevecœur, American Dominique, White Dorking, Colored Dorking, Silver Gray Dorking.

Black Game, Black-breasted Red Game, Brown-breasted Red Game, Red Pyle Game, Silver Duskwing Game, White Game, Yellow Duskwing Game, Sumatra Black Game, Black Hamburg, Golden-penciled Hamburg, Golden-spangled Hamburg, Silver-penciled Hamburg, Silver-spangled Hamburg, White Hamburg, Audalusian.

Houdan, White and Black Minorca, Black Java, Mottled Java, LaFleche, Langshan, Black Leghorn, Rose-comb Black Leghorn, Brown Leghorn, Rose-comb Brown Leghorn, Dominique Leghorn, Rose-comb Dominique Leghorn, White Leghorn, Rose-comb White Leghorn, Black-breasted Red Malay, Plymouth Rock, Bearded Golden Polish, Bearded White Polish, Bearded Silver Polish, Buff-laced Polish, Golden-laced Polish, Silver-laced Polish, White-laced Polish, White-crested Black Polish, Rumpless Russian, Silky, White-faced Black Spanish, Sultan, Wyandotte.

Bantams.

White-booted, Black Game, Black-breasted Red Game, Red-breasted Game, Red Pyle Game, Silver Duskwing Game, White Game, Yellow Duskwing Game, Black Sumatra Game, Golden Delight, Japanese, Pekin or Cochin, Rose-comb Black, Rose-comb White, Silver Sebright, White-crested Winged Polish.

The Egg Business.

A WRITER for the *Prairie Farmer* notes the fact that eggs rise above the prevalent low tide in produce values. Almost everything produced on farms, gardens, orchards and vineyards sells at lower prices than for many years.

Eggs bring as good prices as they did in flush times, and the markets of Chicago and other cities never seem to be overstocked with them. This year very few eggs were packed for preservation, or put in cold storage in Chicago or its vicinity. The Fair induced an unusual consumption of eggs. A large proportion of people who take meals at restaurants call for eggs, especially when they are in a hurry to be served, as is the case when they wish to visit an exposition like the World's Fair. An exceedingly large number of eggs was also wanted to fill lunch baskets, of which thousands were carried into the grounds every day.

Of course the great Fair increased the demand for eggs and helped to sustain prices, but the prospect is that eggs will never be low again. Changes in the condition of society, such as have been going on for many years, are favorable to an increased consumption of eggs. An urban population requires more eggs than a rural population of the same size. This has been repeatedly shown of most of the countries in Europe. Persons who practice light housekeeping, as many do who live in large cities, prefer eggs to meat chiefly for the reason that they are more easily and more cheaply prepared for the table.

The population of cities and large towns is increasing much faster than that of rural districts. This of itself shows that the demand for eggs will increase. Great cities require an enormous number to supply them. The average number of eggs eaten by the residents of Paris is two hundred per year. In London and Vienna the number is still larger.

Next to bread, eggs are the most convenient article of food for persons who have not ample facilities for cooking. They need little preparation and there is no waste about them. They are relished by more persons than any single kind of food. They can be cooked in so many ways as to furnish an almost infinite variety in taste and appearance.

Nothing pertaining to dietetics seems to be better established than that the demand for eggs increases as civilization extends and people congregate in large towns. It is stated that the eggs consumed in France in a single year would, if placed end to end, reach twice around the globe at the equator. Much of this country will soon be as densely populated as France and will require as many eggs. With such a condition of things the price of eggs cannot rule low. We are now importing eggs, and shall probably continue to do so for many years, if not for all time.

Buying Pure Bred Males.

In the fall the breeders thin out their flocks and dispose of the surplus, these are usually the culls, and are often as pure-bred as the best, but not being fully up in points for exhibition they sell at a much lower figure than those which are reserved for the shows.

In writing to a breeder, therefore, always state what you desire the birds for, viz — breeding or to infuse new blood. Good stock demands good prices, but in a short time the investment will prove a profitable one. Through the spring and mating season it is often impossible to procure stock at all. This will be more generally the case with the breeders of a standard reputation.

Mixed Breeds.

We do not mean crossed stock, but those flocks of all colors, shapes and sizes, seen on farms. What is the use of keeping fowls that vary in every particular when a uniform flock is so much better and more attractive? It is very easy to "breed up" a flock. By using a pure-bred male the chickens will be nearly alike, and if the best of them are kept for the next season as layers, the result will be that the owner can breed with greater certainty and to his satisfaction avoid dissimilarity. By then using a cock or cockerel every other

season thereafter, the flock will soon consist of hens so uniformly alike as to render it difficult to distinguish one from the other.

New Breeds.

The "woods are full of them," which their admirers are booming with all the might of printer's ink. We have the Red Caps, the White Wonders, the Blue Audalusians, the White and Black Minorcas, the Dingoes, the Motley Belis, the Peacomb Plymouth Rocks and several others not yet named; and, if we believe all that is claimed for them, each one possesses more good qualities than any other breed of fowls in existence. But farmers and amateur breeders who have no money to experiment with, had better proceed cautiously. If you have fowls of a good established breed, those that give good returns for the food and care bestowed, don't exchange until you know you are getting something better. Sometimes it pays to make haste slowly. For the reasons set forth above we shall confine these pages to a description of the standard breeds, as we have found them from actual experience—that is, the breeds that have stood the test of years throughout this country.



Are stubborn things; and, deny it as we will—evade it as best we can—it is nevertheless true that "Raising Poultry for Profit" is out of the question when pursued on the line of old-time methods and without the facilities afforded by modern improvements. Be alive and up to the times. Equip your poultry-yard with a Reliable Incubator, and what has been a drudgery and loss in the past will become a profitable and pleasant avocation.

Food for Chickens.

Advantage of Dry Food.

WHETHER chickens should be fed water and dry grain or no water and sloppy food, until weaned, is a very far-reaching question. Personally we do not believe in sloppy food at all for chickens. Years ago cows were fed on sloppy food and mash, but experience has taught us that dry bran and meal are more digestible and produce better results every way. The latter is the article of commerce now used more than the old pin-head oat meal. It is soft and the little chicks take it readily. This we feed dry, scattering it on the floor for the chicks to pick up. We took a tomato can and filled it about half full with fresh milk, to which its weight of *boiling* water had been added, and inverted this can in a tin saucer, just large enough for the chickens to readily reach the milk but not large enough to admit their feet getting in. This can was replenished in the afternoon. We have never seen chickens relish a dish as much as that dish of milk. This lot of chickens was fed on oats and milk until a week old when a bread made of ground oats, bran and Indian meal was fed to them. A little cracked corn and wheat was gradually given them, and when three weeks of age the latter was the staple food, but fresh water was substituted for the milk after that. We never saw or raised a healthier lot than the above, barring only one chicken. The above system enabled us to save time, as the dry food could be given, without danger of spoiling or becoming foul, once or twice daily.

Another lot of chickens were fed on cracked corn, rolled oats and cracked rice from the first. They had all the water they wanted to drink and did exceedingly well. The great danger of sloppy food, especially in warm weather, is its becoming sour and producing bowel trouble. This is strikingly so when bran and meal are fed, and we prefer to feed both

dry and let the moisture come from the water. Water is indispensable, especially to brooder chicks. The latter kept in too warm a temperature are apt to drink too much. This was illustrated recently while on a visit to a friend. Our friend had 120 chickens in a brooder and complained that they would do nothing but drink, and did not eat as they should. Investigation showed that the chickens were confined in a dry, hot brooder. He placed a pan of water in the brooder lowered the temperature somewhat and found that the chickens stopped the habit of drinking water almost entirely. This leads us to think that the advocates of "no water" base their experience on chickens raised under hens. If such chickens are fed moist food and great care taken to keep the food clean and sweet, they can get along without a regular supply of water, but foraging in the damp grass certainly gives them a natural supply of moisture not always calculated upon. To watch chickens on a hot day and conclude they need no water is a thing that few men will believe. We have never seen any ill effects in chicks from water if allowed full liberty, but in confinement, under bad sanitary conditions, water is more apt to satisfy the cravings of a feverish and unhealthy lot of chicks than good food will. We saw a very healthy lot of chickens recently that were fed cracked corn and whole wheat only from the start. They had unlimited water to drink and an unlimited range. Taking time and labor and general results as a guide we can state that in our experience we prefer the dry grain and water method with free range as the safest and most profitable.

Cooked Meat for Fowls.

It is too much the practice to feed raw meat to poultry under the mistaken idea that as the worms and insects which they seize with such avidity are uncooked, so should be *any* meat given them by their owners.

But the early worm which biddy takes in her empty crop, soft, pulpy and crushed by the bill before it descends the gullet, is one thing, and the coarse, dry, stringy, fatless flesh thrown to them "in the rough" and the tough, is quite another, even if the carcass of horse or sheep so bestowed is not still more objectionable on account of disease. True, these nearly "dry bones" may serve to while away a weary hour in the monotonous life of the poultry yard, and happily the

fowls may labor under the impression that they are *eating something*. And so they may serve a certain purpose in the poultry world. But for real aid and comfort to the fowls save all your refuse meat, and buy in addition, "liver, lights, heart and all," as the old story runs, from the shambles, and boil all together for two hours or more. Then chop finely and mix with meal in the water in which they were boiled. This dry, rich mess, showing bits of meat, like raisins in plum pudding, will be a dish fit to set before any "queen of the (poultry) harem," and she and her maids of honor will pay you for it in more than words, as your egg basket, high with pearls, will show on many a succeeding day.

Cooked Food.

It is some trouble to prepare and cook the food for a lot of fowls, but it is amply repaid by their more rapid development, and the larger price they will bring when ready for sale. The assertion, that they will grow more rapidly on cooked than on uncooked food has often been demonstrated as correct by actual experiment, and a proof of the fact is that those kept principally on food that is cooked grew away from those which are cared for equally well, except that their food was given them in a raw state.

Market poultrymen, who raise chicks for the early market, give cooked food and find it to be necessary to secure successful profits in the business; and if this is true, the thoroughbred poultry breeder will gain likewise in the greater size and rapid growth of his stock, and thus get them ready for early sales, early shows and better prepared to enter the winter months. The males can be disposed of easier, the pullets will begin laying earlier, and the business will prove more of a pleasure.

Cooked feed should be sufficiently dry to enable the attendant to make it up into balls which will crack open when thrown out.

A Use for Wheat Chaff.

No better use can be made of wheat chaff than to use it as litter in the poultry houses, in which the hens can scratch and exercise. If a gill of millet seeds be scattered in the chaff the hens will work and hunt for the small seeds industriously until every one is found, and as the seeds are so very small,

the hens will be more earnest and diligent, the seeds also being somewhat of a luxury. The chaff will also assist in keeping the floor dry, thus adding to the warmth and comfort of the poultry house during periods of cold or damp weather.

Number of Eggs in a Hen.

A French scientist is authority for the statement that the egg chamber of an average healthy hen contains 600 eggs, and that as a rule, it takes nine years to lay them. More than half of the eggs—between 300 and 375—are laid during the second, third and fourth years, and the number then gradually decreases, running down to thirty in the eighth year and from one to ten in the ninth. This is the apparent reason why hens cease to be productive and are unprofitable after the fourth year.

Feeding Warm Food.

The poultryman who furnishes his flock with warm water twice a day, hits the nail squarely, and in this connection we say give them a good meal of warm feed on cold mornings, whether they be fancy fowls or running about the farm house. It will pay in either case as well as any investment you can make of your time. It may be made of almost any kind of ground grain or mixture of grains. We use a good deal of corn, ground cob and all together (quite fine). This gives them a roughness of feed they cannot well get in cold weather in the absence of grass and such filling feed.

Heating Poultry Houses.

Unless the weather is extremely cold the poultry house will require no heat. It should, however, never be at a lower temperature than 40 degrees above zero, and this can be secured by properly lining a poultry house so as to prevent the entrance of too much cold air. The windows will allow of the entrance and absorption of a large amount of heat during the day, but at night the heat will be radiated away if the glass is not covered on the outside with a piece of batting or a shutter. But in regard to the best method of heating, we should suggest a stove with a sheet iron drum, a stove pipe being connected with the drum so as to conduct the heat to the extreme end. Openings may be made in the stove pipe at

proper distances, to serve on the principle of registers for egress of the hot air, in order to warm every portion of the house. We do not say that a stove so arranged will *heat* a large poultry house, but it should increase the temperature sufficiently to prevent freezing of the combs and wattles. Too much heat should not be desired, as it will make the hens tender and more susceptible to colds and sudden changes.

The Wild Fowl Retreat.

J. C. Green, of Norton Sound, Alaska, states that people wonder where the wild fowl come from. They see the sand-hill crane, wild goose, heron and other fowl every spring and fall pursue their unwearied way, but, like the wind, they do not know whence they come or whither they go. Up on Golovine Bay, on the north shore of Norton Sound, is the breeding place of these fowls. All the birds in creation seemingly go to that country to breed. Geese, ducks, swans and thousands of sand-hill cranes are swarming there all the time. They lay their eggs in the blue-stem grass in the lowlands, and if you go up the river a little way from the bay the noise of the wild fowl is deafening. Myriads of robins and swallows are there, too, as well as millions of magnificent grouse, wearing red combs and feathered moccasins. This grouse turns as white as snow in the winter. Ducks are plentiful. Wild fowls and bears live on salmon berries and huckleberries, which cover the hills.



Profitable Poultry Keeping.

Poultry Raising as a Business.

A PRACTICAL poultryman, Mr. P. H. Jacobs, writes the following in the *American Agriculturist*: A flock of ten hens can be comfortably kept in a yard twenty feet wide by fifty deep. An acre of ground will contain forty such yards, or four hundred hens. No cocks are necessary unless the eggs are desired for incubation. To estimate \$1.50 as a clear profit for each hen, it is not the maximum limit, but the profit accrues according to the management given. Poultry thrives best when running at large, but this applies only to small flocks. Hens kept by the hundred become too crowded while at large, no matter how wide the range, and sickness and loss occur. Large flocks must be divided, and the size of the yard required for a flock is of but little importance compared with that of the management. There is much profit to be derived from the sale of young chicks, and where one pays attention to the business they receive the greatest care. Each brood, like the adult, is kept separate from the others in a little coop, which prevents quarreling among the hens and enables the manager to count and know all about the chicks. This is very important, 'as there are many farmers who hatch scores of broods and yet cannot tell what becomes of two-thirds of them. Hawks, crows, cats, rats and other depredators take their choice, and the owners are no wiser. Each sitting hen should be in a coop by herself, and each coop should have a lath run. The critical period is the forming of the feathers, which calls for frequent feeding, and when they have passed that stage the chicks become hardy. The houses need not be more than eight feet square for each family, and can be doubled. If possible, it is best to have changeable yards, but, if used, a less number can be kept to an acre. If the yards are kept clean by an occasional spading, however,

green stuff may be grown elsewhere and thrown over to them. This may consist of cabbage, grass, turnip tops, kale, mustard, lettuce, etc. Watering must not be neglected, or the meals given irregularly. Care must be observed not to feed too much, as over-fat fowls will lay few eggs, and such eggs will not hatch. A good poultry manager is always among his fowls and observes everything. The breeds have special characteristics also. The large fowls must be hatched in March, if early pullets are desired for winter laying. This applies to Brahmas, Cochins and Plymouth Rocks. If the manager finds this impossible, he should at once substitute cocks of the Leghorn breed, which crossed with large hens, make good marketable chicks, and produce pullets that mature early. A knowledge of the characteristics of the several breeds is indispensable to success. Crossing pure-bred cocks with common hens is excellent, and will increase the prolificness and commercial value of every flock.

Profit in Poultry.

Says James Rankin in *The Homestead*: I have sixteen cows in my barn. My neighbors call them good ones. The milk is sold in a neighboring village at remunerative prices. It requires the labor of two men and one team to milk, care for these cows and deliver the milk. I have 350 pullets in my yard. With but a tithe of the labor and capital employed, these pullets last winter made me more than double the clear money that my cows did.

I am well acquainted with two young men who are running a poultry and dairy farm conjointly. The one is an invalid, keeps 1,000 hens, the care of which occupies about one-half of his time. The other keeps thirty cows, from which he makes butter of so good a quality that it really commands eight to ten cents above the standard price. This man raises the usual farm crops, reads the papers carefully, knows something of labor and its application, and runs his gang of four or five men with an eye to business. Yet the invalid brother clears double the money from his 1,000 hens that his brother does from the whole farm.

One instance more: E. Damon, of South Hanson, Mass., told me not long since that he had 750 pullets in his yard, 600 of which had been confined in one building all winter with-

out stepping out of doors. These fowls had furnished him with thirty-five dozen eggs per day during the winter. These eggs were taken at the door at forty-two cents per dozen. This gave him \$11 clear profit per day, with only a few hours care.

Breeding for Eggs.

To keep hens for laying purposes, where eggs for market only are desired, is a different matter from keeping hens to provide eggs for hatching purposes. It may safely be said that for market purposes, laying and hatching, the conditions vary. It is a well known principle in breeding, that the female must be in a proper condition to become fruitful, and this rule applies to the hen as well as to the animal. The fat Shorthorn cows are often barren, while those that produce large quantities of milk and butter, such as the Jerseys, Holsteins and Ayrshires, usually bear calves every year, as the production of milk prevents overfatting. In making up a pen for breeding purposes, therefore, the poultryman must consider two or three points that must be observed in order to secure good hatches when the eggs are incubated. In the first place, the eggs from pullets do not hatch as well as those from hens, unless the pullets are early hatched. This difficulty may be overcome somewhat, however, by mating two-year-old cocks with them. Again, while the cockerels may be used in the yards, they should always be mated with hens, and not pullets. The conditions to be observed are to feed a sufficiency for all that tends to provide the constituent elements of an egg, without furnishing a superabundance. By feeding so that the hens must scratch, we bring them under the same conditions by which it is known that a mare kept at moderate work will produce a better foal than the one kept standing in the stable and pampered. It is true, as has often been stated by those who sneer at improved breeds of poultry, that they are pampered too much, and especially is this true of breeding hens, as eggs from such do not hatch well, and when they do the chicks are weak and sickly. No amount of lime or oyster shells will prevent soft-shelled eggs from hens overfed, while disease is liable to occur among them at any time.

We often read of hens that lay 200 eggs a year, but such statements do more harm than good, by inducing the inexperienced to believe such to be a fact. Any one who is

familiar at all with poultry knows that during the fall all hens undergo the process of moulting, or shedding of the feathers. This requires usually about three months, or 100 days. As there are only 365 days in a year, we have 265 days left after deducting the moulting period. If a hen lays regularly an egg every other day, she will lay 133 eggs, but she will probably lose three months more in hatching out her broods, and even if she is a non-sitter, she will take a resting spell. As moulting is a heavy drain on the system, but few hens lay during that process, though there are exceptions, and where the number of eggs exceed one every two days, it will be found that a corresponding reduction occurs during some period of the year. While we admit that certain individual hens have been known to lay as many as 150, or even 175 eggs in a year, such cases are rare, and if one has a flock of twenty hens or more, he should be satisfied if there is an average of 100 eggs a year for the whole flock, or rather nine dozen. Four dozen out of the nine should realize thirty cents a dozen, three dozen should bring about twenty cents a dozen, and two dozen should realize fifteen cents a dozen in this section — an average of about twenty-three cents. Of course this calculation may be wrong, but it will convey an idea of what may be expected.

Many poultry raisers provide their fowls with warm quarters, and feed regularly and on a variety, but yet they get no eggs. Such cases are numerous, and we will endeavor to point out a remedy for the difficulty. We well know that if we keep a horse in a stable, and feed him well, that he becomes restless and unhappy, and in order to keep him in good health he must be exercised. With fowls, the winter prevents foraging, and our kind readers go to the coops in the morning and give the hens a good, heavy feeding. The hens being full, are *satisfied*, and have no inducements to ramble, consequently, do not take any exercise and become too fat. The better plan is to get some chaff, cut straw, leaves or even dirt, and place it where the hens can scratch in it. In the morning give the hens a mess of warm food, but *only a little*. Now throw some grain into the scratching heap, and make them *work* for the balance of their meal. Feed nothing but what they will have to *work* for. At night feed them all they will eat. The object is to keep the hens busy during the day, but let them go on the roost full. Hens that are compelled

to work will lay better and keep in good health, while the eggs will produce stronger chicks. They should always have a warm mess early in the morning, especially in the winter, but the meal should be so given as to leave them somewhat hungry. Do not feed them at noon except by putting their food in the scratching heap, and never give soft food in the scratching heap. In other words, keep them scratching for oats, wheat, seeds and even for ground shells. Give no corn except at night, and give them their night's meal without making them scratch for it.

Breeding for Market.

While it is admitted that the marking and plumage of a bird is an index to its purity, yet we often see the sacrificing of some of the best in the flock because of a slight defect that does no injury, but which serves as a disqualification in the show room. This practice has been very damaging to the value of the breeds for utility, as the plumage in no manner affects the laying qualities or adds to the attractiveness of the fowl for market. And yet, without a strict adherence to some definite rule by which the breeders of thoroughbred poultry can be guided, our flocks would degenerate into dung-hills and their characteristics as breeds be entirely lost. But there is a limit even to the fixed outward indications, and when once the desired object has been attained of giving them a uniform exterior the more important essentials should not be overlooked. Poultry is destined to serve a grander purpose than that of being petted. The majority of those interested have no inclination to devote their time to the breeding of beautiful birds only, but prefer to realize a profit from carcasses and eggs; and hence any attempt to sacrifice vigor and strength, in order to secure straight comb or a certain shade of color, will in the end prove detrimental. This is proved already from the fact that while the fancy breeders have been more exacting in their standard requirements than any other class, yet they have not succeeded in securing a flock of uniform show birds from the best of their prize-winners, while the Berkshire swine-breeders, who give but few points to color marks, have only a small number of culls in their herds.

The farmers who raise poultry for market, however, owe much to the breeders of fancy poultry, for despite all mis-

takes they may have made, they have preserved the purity of the breeds, and as their standard is only in its infancy, the time will come when all the breeds will combine not only the characteristics of utility, but convey also the outward evidences of the purity of the stock.

Select those that come up to the standard in points, if you can, but do not discard a good specimen of robust constitution for a slight defect. Be liberal in allowing a few fowls to have drawbacks if such imperfections are such as to cause no injury to the offspring, but above all, select for vigor and strength. It is not always the largest fowl that is the most vigorous, but the one with full bright eyes, heavy bone, compact body and quick movement. In plumage, see that the color of the hens harmonizes with the color of the cock. If the hens are too dark allow the cock to be somewhat lighter, and if the hens are very heavy in the body, use a medium sized cock. Too much weight is not desirable in fowls, although many boast of weight in preference to other qualities. The chief object, no matter which breed is used, should be vigor and activity. An overgrown, excessively fat fowl is a nuisance, and should not be tolerated.

Poultry Keeping for Profit.

During the year 1884, Mr. Henry Stewart contributed to the *New York Times* a series of articles containing many valuable suggestions for those who wish to make poultry keeping a business. His plan is briefly as follows: Each yard is to consist of a plot of ground about 100 x 400 feet, containing nearly one acre, with a suitable fence. The house is placed in the center of the yard and a cross-fence on a line with the house divides it into two parts. These two parts are alternately sown thickly with some crop that will afford forage for the fowls. In September they are placed on one side sown thickly with turnips. The other is immediately plowed up and sown with rye. The fowls will do very well for the winter in one side, with an occasional day in the green rye. In November wheat is sown after the turnips are eaten off. In April we may sow oats, in May corn, in June rape or mustard seed and in July begin the rotation again with rutabagas.

As a rule a house twenty-five feet long, ten feet wide, eight feet high in the front and five feet in the rear, will be

quite large enough for the one hundred fowls to be kept in each yard. This should be cleaned at least once a week—the oftener the better. The inside walls are quite smooth, having no fixtures except the roosting poles, which are on a level one foot from the ground. This leaves no harbor for vermin. The nests are loose boxes. Mr. Stewart also suggests that where a series of yards are kept, the inside fences may be movable, so that while the fowls are all confined to one side, the fences may be removed from the other, thus facilitating the plowing and planting.

“It is evident,” he adds, “that this system will greatly enrich the soil, and this may be turned to good account by raising fruit trees in the poultry yards. No other fruit crop pays so well as plums, but none is so hard to grow on the account of the pestiferous curculio. But when plums are grown in a poultry yard this insect has no chance. The sharp eyes of the fowls let no rogue escape, and one can raise plums with success and profit. As 200 of these trees can be planted on one acre, there is a possibility of \$400 per acre from the fruit as well as \$200 from the fowls; for every hen well cared for should make a clear profit of two dollars in the year. The yards may be planted with dwarf pear trees, with equal profit or more, because 300 of them may be placed on one acre. The shade of these trees is invaluable.” It is also recommended that a row or small grove of Norway spruce, *Arbor viatæ* or Austrian pine be planted each side of the house to serve as a wind break for the fowls in winter.

One Dollar per Hen.

Somebody, writes a breeder, wants to know if \$1 per year profit from each hen is a good average. Where hens are kept as the majority of farmers keep them, \$1 per head is quite as much as the owner ought to expect, and I don't believe the average farmer can make \$100 easier than by keeping and caring for a flock of 100 hens. If he will do a little something extra in the way of housing, care and feed, the hens will add at least fifty cents to the average dollar. Why we have pullets that at present writing have laid a dozen eggs apiece since they first commenced laying, the first week in October, but they didn't roost in the trees and live on sawdust and gravel; they had a good, warm house and plenty of food and care. If those pullets don't earn considerably more

than their "average dollar" per head before next spring I'll cut their heads off, every last one of them. And I may as well tell you that when I fail to make at least \$3 profit for each hen, duck and turkey kept for breeding stock, I don't brag much about my success in poultry raising.

Winter Egg Production.

The following is from the *Country Gentleman*: To obtain a breed of fowls that are perpetual layers is the object that many aim at. This is an impossibility, for nature will exhaust itself and must have a period of rest. In order that we have a perpetual production of fresh eggs, the business must be arranged beforehand. There is a difference in breeds, some laying better than others at any time of the year, and others, again, giving their eggs in winter. There is little difficulty in obtaining eggs in summer, but the winter eggs must be worked for, and the fowls managed beforehand. Hens that have laid well during the summer cannot be depended on for late fall or early winter, even if well fed, but will generally commence in January and keep it up throughout February and March, giving a good supply of eggs if not too old. But it is better not to allow such birds to go into the winter. They are generally fat, after having finished the annual moult, and should be killed for the table. After the second annual moult hens are apt to become egg-bound, especially if well fed and fat. The excess of fat that accumulates about the lower intestines and ovaries weakens these organs and renders them incapable of performing their offices. Hence the fowl suffers and becomes profitless. When left too long the bird becomes feverish and the flesh is unfit for food. The better way is to avoid this trouble, since there is no cure, by not allowing the birds to go into the second winter. Trouble of this kind seldom occurs with pullets or young hens.

To obtain a supply of winter eggs, we must have the chicks out in March or April. Leghorns and some of the smaller breeds will do in May or the first of June, but the Brahmas and Cochins must come off early, that they may have the full season for growth. The Asiatics are generally good layers in winter, and need less artificial heat, as nature has not furnished them with any ornamental appendages which suffer with exposure to the frost. For them it is not

necessary to spend large sums in warm buildings. What they can dispense with in this respect they demand in feed, which must be given regularly. The feed must be kept up and varied with animal and vegetable diet. The supply of water must never fail. We must feed and feed a long time before the eggs will come. Any breed of hens will consume an enormous quantity of feed before commencing to lay, but later, having once begun, they will not require or even take so much grain. When laying their great craving is for vegetable and animal substances and crushed clam or oyster shells.

Fowls that are regularly trained have certain portions of the day for their different feeds. My birds require their shells at night, as well as their greens, and their grain in the morning, and always fresh water. When one has the time and convenience, and enjoys the petting of fowls, making warm stews on very cold days is an admirable plan, and the birds relish them marvelously. Take beef or pork scraps, and put into an old kettle, having them previously chopped fine, and fill it half full of water. While stewing, throw in a dozen chopped onions, two dozen cayenne peppers and the day's coffee and tea-grounds. Thicken the mixture with cornmeal, and serve it around among the hens hot. They relish it amazingly when once taught to eat it, and will look for the ration daily at certain time. On cold winter days give this feed between two and three o'clock in the afternoon, and the chickens get their crops warmed up for the coming cold at night. If scraps are not handy, boil unpeeled potatoes and serve in the same manner, adding a little grease or cold gravies left over from yesterday's dinner.

The combed varieties require warmer quarters and sunnier exposure than the Asiatics, and are good winter layers after December and early January. They will lay in the fall if early hatched, but the change of fall to winter, and the getting into winter quarters affects them, and they seldom commence again before the days begin to lengthen, at which time Brahmas will cease egg-production and become broody. Where one has the convenience it is well to keep both kinds, in order to insure a supply of eggs. It is useless to expect many eggs from old fowls of any variety. Have the buildings ready early and the fowls of the right age and in condition to insure success. The business of our domestic hen is to produce eggs, and we must feed her for it.

The Profit from Poultry.

A dozen hens, valued at \$9, may pay for all their feed and yield a profit of only seventy-five cents each. Such a sum would seem very insignificant, but it is 100 per cent on the capital invested. True, the hens require attention and labor, while the expense for buildings must not be overlooked. But buildings are permanent investments, and will last for several seasons, while the labor bestowed upon a single small flock would not be increased if ten times the number were cared for. An attendant would find no difficulty managing several hundred fowls, while fifty cents is estimated as the proportion for each hen to contribute as her share of the expense for the poultry house.

A dairyman will buy a cow for \$75, and build a large barn for his herd. He must not only grow or purchase his grain and other feed fed in his troughs, but he must also provide a pasture. The cows must be milked twice a day, and the milk hauled in all kinds of weather. If butter is made the labor is increased. The capital invested in a single cow, estimating use of land, labor, buildings and value of the animals, seldom falls below \$200, and if the cow gives a profit of \$50 per annum she is considered a good one. And yet the dairy business is considered a paying one, although the profit does not reach twenty-five per cent on capital, but we have allowed it here. If the poultryman realized twenty-five per cent on capital invested in poultry he would be dissatisfied. It is a very inferior flock that does not pay fifty per cent, and hundreds of cases may be cited in which two hundred per cent on capital invested in poultry has been secured.

Profitable if Cared For.

When it is claimed that poultry returns a larger profit for capital invested, the fact applies to both small and large flocks. If the hens are treated as *stock*, and managed as is done for horses, cattle, sheep and swine, they give large profits for labor, care and capital invested, but the great difficulty is that the majority of farmers do not look upon poultry as *stock*. Even where the flocks are overlooked they give good profits on some farms, though the farmer may not be aware of the fact if he keeps no accounts. There are but few instances known in which the hens have failed to more than

pay for themselves, and they yield hundreds of eggs to those who have never considered poultry profitable, simply because the amount received is estimated in cents instead of dollars.

How to Fail.

There are many persons who have started in poultry raising and at the end of the first, second or third year became tired of the business and quit in disgust. This has been the case more particularly with men who undertook to breed fine pure-bred stock for sale, with the hopes of immediately making large sums of money. We often hear some one state that he would not have a Brahma, a Leghorn or a Game fowl about his yards, but we as often learn that at some period in said individual's life, through his own ignorance or want of energy and ordinary ambition, he has not only defrauded himself out of money, but has made his fowls the instruments with which he has accomplished the work. Himself entirely at fault, yet he throws the blame upon the fowls. They eat too much ; they ruined his gardens ; they would freeze their own combs and feet ; they would die on their nests ; they would not lay ; in fact they were the poorest breed of fowls to be found in the country.

In every such case the whole trouble is in the make-up of the individual and not with the fowls, and if any reader of this article has been a loser in the poultry business, whether in raising fowls for market, or for breeding and exhibition stock, and will state his case, we can refer him to men in the same business who are to-day making money out of the same breed of fowls.

We have for the last fifteen years given this matter some attention in order to decide in our own minds what are the stumbling blocks over which these men fall, and we here name a few of them and give a few hints which will aid the beginner in commencing and carrying on the business until he has gained a firm footing. The first step this man who fails takes when he has decided to launch out in the poultry business is to purchase eggs from pure-bred fowls, or the fowls themselves, of the variety he most admires, feeling confident that with and from these, his start in the business will be well established, and that at the end of the first or of the commencement of the second season, he will stand on the top-most round of the ladder, side by side with men who

have been breeding his favorite fowls for years and are known the world over, and that all his extra fowls and eggs will find a ready market of enormous prices.

He immediately notifies a score of breeders that he is now ready for business and will be pleased to receive by return mail their very lowest, rock-bottom cash prices for their very best pure-bred stock and eggs from same. The circulars and price-lists are received, and without having posted himself as to who has the best fowls of the breeds he desires to purchase, he orders fowls or eggs from the man who offers the greatest inducements in quantity. With him quantity is the thing, not quality, for his figures show that if a trio will net him \$50 per year, double that number of fowls and he will have \$100 net profit for the first season's labor. Then, to his mind, the cheap are possibly as good as the dear, and if they are not, who can tell the difference from the eggs?

The fowls are received, pronounced good by the neighbors, placed in the "old hen-house" which has not been cleaned out for years, receive plenty of food and good care, until they become an old story, and from that hour are neglected. Hens are set, but the lice drive them from their nests, or, in case the hens are of a determined, desperate disposition, the lice will sap the last drop of life blood, and leaves bone, muscle and feathers on the nest, and a query in our young fancier's mind why pure-bred fowls are so delicate, so hard to raise and die so mysteriously. Mention lice to him and he is thunderstruck. *He* never saw a louse on one of *his* hens. State the fact that lice *killed* his favorite hen, and he will not only deny it in the strongest terms, but you will see that he already weakens in his good opinion of his favorite stock.

His fowls, run down from attacks of lice, out of order from a steady diet of whole corn, are attacked with roup, and finally set at liberty to mingle with the neighbors' common stock. A few chicks are hatched, and those which survive the ravages of cats, rats and lice, contract disease from exposure to storms, want of shelter and shade and a diet of sloppy and sour feed, as often thrown upon the filthy ground as otherwise. Thus they are dwarfed in size, have delicate constitutions and become, in fact, a flock the condition and appearance of which would dishearten any man.

With this stock for a foundation, our fancier advertises eggs from prize-winning stock and sells only to receive con-

démnation from the buyer for the motley lot of chicks raised from the eggs. Unknown to our young fancier, his fowls had been crossed with his neighbors' barnyard fowls, and his own chicks are now of all colors, and he remembers the breeder of whom he made his purchase as a knave, the fowls as a worthless breed, and the poultry business as a failure, little thinking that there is no one to blame but himself, and that by proper management, a little thought and care on his part, the loss could have been turned to profit.

Profitable Experience in Poultry Raising.

To show how poultry raising may be made as profitable perhaps as labor in the workshop, writes a farmer, here are the details of what the wife of a small farmer in my neighborhood is doing. She wintered thirty-seven hens and two roosters, and during this time the flock laid nearly eggs enough to pay the cost of their food. Early in March she began setting the hens as they brooded.

By the middle of May she had 141 chickens, and had only lost two. She is going to keep on setting hens until July, when she will probably have at least 300 chickens. In June, the earliest will be two and a half to three months old, plump and suitable for broilers. For them she will obtain a high price. As the summer advances, prices will gradually fall, but even through autumn chickens pay a fair profit, and during the whole time she will be selling eggs, perhaps enough to pay for the feed of the flock.

Now, as to the fixtures to carry on this business: There is a cheap, well-ventilated poultry house, and old flour barrels with one head taken out, chiefly used for nests and for coops. The chickens are weaned when six weeks old, and placed in the barn at night, where they sit safe and warm on the thrashing floor till morning. They are given feed, a drink of skimmed milk, and left to wander around the ground at will. The barn door is left open to the south, so they can go in for feed and drink as often as they desire, and also for shelter if it rains; but as the hens have been let out of their coops since the chickens were a week old, they grow up quite hardy and don't mind a little rain.

The soil here is admirably suited for raising chickens, it being a light gravel, which dries immediately after a rain, and is consequently never muddy.

When setting a hen, a piece of dry turf is cut 12 to 16 inches square, hollowed out a little on the under side, so as to make a corresponding hollow on the upper, to safely hold the eggs. The turf is now laid on the bottom of the coop or barrel, grass side up, and the eggs placed upon it. A little sulphur is sprinkled around the neck of the hen, beginning close to the head, also on her rump and under the wings. This kills lice if she happens to have any. The turf has the advantage of keeping warm while the hen is off to feed, drink and wallow in the dirt, and it also prevents the egg shells from getting so hard and dry as to make it difficult for the chickens to pick themselves out. After hatching, the turf is removed and a peck more of sand or loam is put in to keep it sweet and clean. This is renewed weekly.

Poultry on a Large Scale.

People thinking of raising chickens on a large scale will do well to note the following good advice given by the *Poultry Monthly*:

"There are many persons of moderate means who have had perhaps some little experience with breeding poultry and who get to wondering if it will pay to breed poultry on a large scale: whether it will pay to embark in the breeding of poultry for market purposes as a business, and if it is good policy to give up a fair paying clerkship or small business to engage in it. Such questions are very difficult to determine to the satisfaction of all persons concerned, for much more really depends on the person than on the business in nearly every department of human industry, and where one person may make a success of any undertaking another one may fail, though having started with equally as good chances of success. Poultry, to be successful on a large scale, must be kept in small colonies of about fifty birds each, for many more than that number in a single house is apt to cause sickness or disease, ere long, among them. Small flocks like that can be given better attention than larger ones, and the first approach of disorder can be seen readily and promptly checked, while there is less danger of great loss when thus kept in small flocks, as the trouble can usually be confined to the flock in which it started, by proper and prompt sanitary measures. When the breeder is not too far away from large retail markets, and especially where the breeder can market them himself,

thus saving commission, freight and loss, it pays best to breed and keep poultry for the eggs they produce, as eggs known to be strictly fresh are always in good demand at quite an increase in price over that received for the ordinary "store" eggs. Such breeds as the White and Brown Leghorns, and birds bred from them, either pure breed or cross breed or grade, as a basis, are first-class egg producers, while a Game cock is also valuable to breed to good common hens, producing, as a rule, vigorous, active pullets, which are invariably good layers. Those who wish to raise poultry principally for the flesh should raise the Light Brahmas, Plymouth Rocks, Dark Brahmas, or some of the Cochin breeds, the first two named, however, being general favorites in this respect, and also combining with it good laying qualities under favorable circumstances. Those who cannot or will not give the poultry regular or constant attention, shelter them properly, supply proper food in liberal quantities and at frequent and regular intervals, and pay a strict attention to cleanliness and thoroughness in all the details of the management, need not expect even to succeed, nor even consider the question of loss or profits, for success and profit here means work, work, work."

Don't Crowd.

This piece of advice is meant particularly for those who kept a flock of early pullets last winter and made them pay a good profit. They now have the "hen fever" (*i. e.*, the people who kept the pullets have it), and they will figure thus: Last winter I kept 30 pullets, and they paid me clear profit of a dollar a head; this winter I will keep a hundred, and make a hundred dollars. That's all right; keep a hundred pullets, and make a hundred dollars; but for mercy's sake don't try to keep a hundred, or even fifty, in the room where you only kept thirty before. If you crowd that way, the chances are that you will make a hundred out of pocket. There is too much of that kind of poultry keeping, and it is the kind that don't pay. If you have only room for 30 fowls, don't try to keep more than that number until you can provide more room. Keeping two fowls in the space that should be occupied by one has never yet paid, and it never will. When the people who have the 1,000 hen fever get that idea well into their heads, they will either give up the keeping 1,000 hens, or else provide room for 1,000.

Successful Poultry Raising.

Mr. Charles Lyman, a successful raiser of poultry, writes as follows: In raising poultry or stock of any kind, it should be the aim of every one to keep it healthy and improve it. You can do it very easily by adopting some systematic rules. These may be summed up in brief as follows:

1. Construct your house good and warm, so as to avoid damp floors and afford a flood of sunlight. Sunshine is better than medicine.

2. Provide a dusting and scratching place where you can bury wheat and corn and thus induce the fowl to take the needful exercise.

3. Provide yourself with some good, healthy chickens, none to be over three or four years old, give one cock to every twelve hens.

4. Give plenty of fresh air at all times, especially in summer.

5. Give plenty of fresh water daily, and never allow the fowls to go thirsty.

6. Feed them systematically two or three times a day, scatter the food so they can't eat too fast, or without proper exercise. Do not feed more than they will eat up clean, or they will get tired of that kind of feed.

7. Give them a variety of both dry and cooked feed. A mixture of cooked meat and vegetables is an excellent thing for their morning meal.

8. Give soft feed in the morning, and the whole grain at night, except a little wheat or cracked corn placed in the scratching places to give them exercise during the day.

9. Above all things keep the hen house clean and well ventilated.

10. Do not crowd too many in one house. If you do, look out for disease.

11. Use carbolic powder occasionally in the dusting bins to destroy lice.

12. Wash your roosts and bottoms of laying nests, and whitewash once a week in summer, and once a month in winter.

13. Let the old and young have as large a range as possible—the larger the better.

14. Don't breed too many kinds of fowls at the same time, unless you are going into the business. Three or four will give you your hands full.

15. Introduce new blood into your stock every year or so, by either buying a cockerel or setting of eggs from some reliable breeder.

16. In buying birds or eggs, go to some reliable breeder who has his reputation at stake. You may have to pay a little more for birds, but you can depend on what you get. Culls are not cheap at any price.

17. Save the best birds for next years breeding, and send the rest to market. In shipping fancy poultry to market send it dressed.

Will it Pay to Hatch Broilers in Summer?

Those who have hatched chicks early and secured the best prices will not be easily satisfied with the low prices that usually prevail in summer, but chicks may be probably hatched at this season if a large number are brought out.

The egg from which the chick is to come will cost one cent, and the food should not exceed five cents per pound. At thirteen weeks old the chicks ought to weigh at least two and one-half pounds, and three pounds is not too great for that age. Now it is seldom that a three-pound chick sells for less than fifteen cents a pound, but we estimate at two and one-half cents a pound weight, at ten cents a pound, or twenty-five cents for each chick. The total cost for eggs and food will not be over fifteen cents per chick. That leaves a profit of ten cents. This seems very small, but it is a large *profit*. The investment is only fifteen cents, and the increase $66\frac{2}{3}$ cents in thirteen weeks, or $333\frac{1}{3}$ per cent in one year. But, then, there is the labor. Labor, however, is what you are really selling. If, by expending fifteen cents, you can sell one dollar and twenty-five cents worth of labor, it is a good investment, even when viewed in that light, for the figures show it to be the case.



Feeding and Rearing.

Animal Food for Chickens.

ECONOMY in the distribution of the grains and other food furnished our poultry is a matter that deserves the closest attention in our daily work and our earnest consideration when we are making up the bill of fare for the season. We may build costly and elegant houses, and spend time and money on the runs and all the accessories of a first-class establishment, but the cumulative cost of food will, in a few years, aggregate a sum as large or even larger.

A poultry house may be expensive, but as long as it is well planned and built it is a profitable investment; and once finished, the chances for waste and loss are gone. But with provisions this is not the case. It is not sufficient to give enough every day. We must see that there is neither loss to the fowls nor their owner through overfeeding or scant supply, and that a judicious variety of feed is used.

Though the losses through lack of economy are not so large when but a dozen or twenty fowls are kept as when the breeder has a hundred or more to look after, they are by no means to be despised, no matter how small; for if the loss is small, the profits from a few fowls are small also, and the percentage of loss is the same in each case. When we come to poultry keeping on a larger scale, however, the strict economy necessary is very apparent. While the number of fowls kept is small, their sustenance could, for the most part, be drawn from the refuse of the table and cost nothing; but when a large number must be maintained—in health—it is evident that this source of supply will be entirely inadequate. To obviate this difficulty it is necessary to make special “messes,” suited to the almost omnivorous appetites of domesticated poultry. Fish and flesh are all one to any

flock ; and when nature does not furnish enough in the way of worms, grasshoppers and other forms of "meat on the hoof," we must supply the deficiency by preparations of chandlers' scraps and refuse butchers' meat—as a rule, made into a sort of hash, with meal—and green food of any available description. When meal dough is used, however, pains should be taken to see that only as much is made as can be eaten up clean at once, or else that which is left over should be kept in a cool place, as otherwise it will sour rapidly and when sour is inimical to health.

Young chickens need animal food particularly. When it fails to do them good it is in consequence of the common fault of over-feeding. They cannot bear big rations of rich food. Watch the mother hen at liberty scratching for her young brood, and see how infrequent and how small the morsels, and how many the competitive mouths. Now the practical question arises, how shall we best supply animal food artificially? A method has been recommended for producing maggots as food, not only for chicks but old fowls, and in sufficient quantity to give a large flock a meal every day.

The first step is to dig a trench, a foot deep and six feet square, and brick up or cement the sides so that none of the maggots can escape. Then throw in enough straw, that has been used as bedding for horses, to make a layer three inches thick. On this place a layer of horse manure a couple of inches thick, spread evenly. Next make a layer of scraps from the table, Indian meal, yeast and almost anything which will cause fermentation rapidly. This layer should be about one inch thick. Lastly, sprinkle about an inch of loose dirt, and over all place a roof tight enough to keep out rain and sun, but open under the eaves.

These preparations completed, bide your time and the coming of the muck flies which will take possession and lay their eggs. In a few days the pit will be swarming with maggots, and a feast for your fowls be of easy access. By making two or three pits, a constant supply will be furnished, which will stand in the stead of much other animal food and effect quite a saving.

So far so good—or, perhaps, so *bad*. There is something mean and disgusting about this process, and meal worms are neater, though perhaps not one whit more healthful for the

chicks. First, What is a meal worm? many will ask. A meal worm is the article so often found in ship's biscuit and the "hard tack" used in war. It frequents granaries and bakeries, and does much damage by boring through sacks of meal and flour. Although a pest, its pure food makes it very cleanly and a delicate tid-bit for young chicks.

To produce these worms in quantities it is only needful to get a small stock, say three hundred, and place them in an earthen jar with scraps of old leather and other refuse animal matter mixed with bran and refuse meal.

Place some cotton waste on the mass and keep it moist with water, and in a short time the worms will increase at an almost incredible rate. In sixty days there will be enough to give the chicks a meal daily.

Fresh fish make a mild, nourishing animal food for young chicks: There is quite a host of our readers who live near large bodies of water or rivers where fishing is carried on during almost all months of the year when the water is open and free from ice. Many of the small fish are either left to decay on the shores, or to be devoured by gulls and other birds. Many cart loads of them are annually used as manure. There is a far better use for a part of these offal fish, and that is as poultry food, for which they are valuable, especially to fowls in confinement.

There are several ways of preparing the fish. The best and simplest is to take a portable boiler about half full of fish, fill up with cold water and start your fire. As soon as the water comes to a good boil, the fish will be sufficiently cooked and ready to be removed. When the fish are cooked they fall to pieces. Now take some of the fish, bones and all, and mix corn-meal with this and the liquid the fish were boiled in, and you have a mess which the young birds will greedily devour and will thrive upon. Do not feed too much at a time nor oftener than every other day on this food, for too much of a good thing is as bad as not any. Some persons on the shore or near the fisheries cook a small mess fresh for their fowls every other day, while others with large flocks of fowls and ducks cook a barrel at a time and make a slop with them, the juice they are cooked in and bran, corn-meal or corn and oats ground, mixed with it, feeding the mess with evident good results.

But in the absence of fish, potatoes boiled in milk, where there is plenty of the latter upon the place, is an admirable preparation to feed to young growing chicks. A mixture of one-third corn-meal and wheat bran, with the above, if given to them *fresh* every day, will make the young chicks grow wonderfully, more especially if they have a run at large in the fields, where they can exercise themselves properly by hunting and chasing insects, grasshoppers, etc.

It will not pay to purchase milk for this purpose, probably, although this depends upon circumstances. But upon the country estate there is always surplus milk (sweet or sour) that is thrown to the pigs. Give this to the young poultry, and it may thus be turned to better account. And although sweet milk is better than stale for this purpose, yet any kind of skimmed milk, sour milk, whey, buttermilk or bonnaclobber, is excellent to mix the dough with, which is fed to chickens. Try this, you in the country who have been in the habit of throwing your waste milk into the hog-pen; and as for the poultry raiser in village or suburbs of the city, latterly the advent of creameries has in some cases placed within his reach skimmed milk peddled from these establishments at low prices.

Amount of Food Required Daily.

In an experiment in England for the purpose of determining the daily amount of food consumed by different breeds of fowls, the following was the result: -

| | | |
|--------------------------|----------|-------------|
| Dorkings | 6 ounces | 391 grains. |
| Games | 4 " | 275 " |
| Buff Cochins | 17 " | 296 " |
| Langshans | 7 " | 31 " |
| Dominicks | 4 " | 326 " |
| Brown Leghorns | 4 " | 398 " |
| Hamburghs | 4 " | 120 " |
| Polish | 4 " | 28 " |
| Guinea Fowls | 4 " | 182 " |

It will be seen that the buff Cochins eat much more than any of the other breeds, and to show the increase of weight in proportion to food consumed it may be stated that each gained daily as follows for twenty days:

| | | | | |
|--------------------------|-----|-------------|-----|----------------|
| Dorkings | 138 | grains laid | 130 | eggs per year. |
| Games | 92 | " | 100 | " |
| Buff Cochins | 77 | " | 115 | " |
| Langshans | 123 | " | 115 | " |
| Dominicks | 92 | " | 110 | " |
| Brown Leghorns | 107 | " | 190 | " |
| Hamburgs | 92 | " | 239 | " |
| Polish | 46 | " | 98 | " |
| Guineas | — | " | 75 | " |

It will be noticed that the Hamburgs gave the largest number of eggs and the Brown Leghorns next, but the Dorkings and Langshans made the largest daily gain in growth, while the Cochins, though consuming enormously of food, did not show its effect either in eggs or the first twenty days' growth. Taking the three highest for weight at six months, the following was the result:

Dorkings weighed 10 pounds, 1 ounce and 685 grains.

Buff Cochins weighed 9 pounds, 13½ ounces.

Langshans weighed 10 pounds, 5 ounces and 437 grains.

The greatest gain was made by the Langshans, but for the food allowed the Dorkings are entitled to the honor. We give the above as the result of experiments in England. In this country the conditions would be reversed perhaps. Hamburgs seldom lay as many as 239 eggs, but in England the climate seems best adapted to both Dorkings and Hamburgs. In estimating the results, the *kind* of food should be considered, which was not given. We use corn largely in this country, and hence experiments here would be conducted differently. Chicks when hatched usually weigh about one and one-half ounces, those from the large breeds having an advantage. We hope some of our readers will conduct similar experiments.

Feeding.

The frequent admonition to feed a variety of food is not given simply to gratify the desires or appetites of the birds, but for another purpose. The hen is used by us as a *producer*, and as she cannot produce anything without the material from which to do so, she is useless unless her wants are supplied. She consumes a large amount of carbon every time she inhales air, while the bones, flesh and nervous system are constantly being wasted and repaired. Should this

waste be permitted, without a renewal, the bird will die—starve—although she may be fed liberally, as far as *certain kinds* of food are concerned. If she received nothing but corn, she would become very fat, as corn is rich in carbon, and her body would be kept warm from the heat created; but while fat and apparently in good condition, her bones and tissues would gradually waste away, and she would droop and die without apparent cause. But food of a carbonaceous nature is required also in some form as the heat of the body is necessary, while carbon is an important constituent of the yolk. Corn contains a small proportion of all the elements of food, but in insufficient quantities for the proper nourishment of a laying hen. We may divide the food proper into three kinds—carbonaceous, nitrogenous and phosphatic. The minerals—lime, soda, potash, etc., must also be included.

Some of the grains, such as wheat, oats and buckwheat, furnish quite an amount of all the elements needed, lime included, but as such foods are not perfectly balanced with all the hen requires, they serve her purpose for only a short time. Hence, when a chick is growing, the rapid formation of muscle and bone (not fat) requires food rich in nitrogen, which is best given in the form of milk or meat, and it is the absence of nitrogenous food that causes them to die when they are fed on corn meal. The egg is largely composed of nitrogen, the white especially, and the hens that are fed on meat and milk as a part of their diet, will lay in winter if kept warm. To vary the food means to vary the quality of the articles provided, in order that no element may be lacking, and while it is important that the food be of a varied character, in order to provide all the proper materials necessary, the fowls need succulent and bulky food for dietary purposes. Corn, wheat, meat, etc., are *concentrated* foods, and should be accompanied with grass or any kind of bulky food, in order to assist digestion, as well as plenty of water, just as a horse needs hay, although he may be allowed all the grain he desires. In feeding a variety, however, do not overfeed. Never allow the stock to get too fat, or the hens will lay soft-shell eggs or none at all. Fat interferes with the generative functions. Always endeavor to make the hens exercise, by scratching for their food. If they are made to work and are fed on food containing the necessary elements, they will lay, and cannot refrain from doing so.

Why the Chicks do Not Grow.

Several correspondents, writes Mr. P. H. Jacobs, have written asking for information regarding young chicks. One of them has been feeding largely of corn meal, and states that the chicks do well enough until they begin to feather, when they then droop and become sickly.

This is due to the fact that corn meal contains but a small proportion of the elements that assist in the production of feathers. In developing feathers, and just when passing from the "downy" condition, the chick must have suitable food, and often, or it will perish, even when surrounded by an abundance of food not required for feather growth. A feather contains nitrogen and the phosphates, the nitrogen (as ammonia) being made known to the organs of smell when the feather is burned. This nitrogen is that which is derived from meat, milk, the gluten of wheat and oats, blood, and sometimes from green food, but most abundantly from meat, milk and wheat grains. The phosphates are derived principally from ground bone, wheat, oats and milk. The feather also contains sulphur, soda, magnesia, lime and other mineral elements. To properly feed the chicks, they should have such a variety of food as will contribute to all the wants of the body, and corn meal, though imparting fat or heat, will be found insufficient. While feeding these concentrated foods the chicks require, also, something of a bulky character, such as cooked potatoes, chopped grass, cabbage, lettuce or onions, which serve to assist the digestion. A complete food may be made as follows: Cook ground oats until well done, in enough water to serve the purpose, until a gallon of the porridge has been prepared. Then add a quart of fresh blood or two pounds of finely chopped meat, half a pound of linseed meal, an ounce of salt, one-fourth of an ounce or sulphur, a pound of ground bone, and enough water to allow it to cook fifteen minutes more. While hot, add half a gallon of milk, and thicken the mass to a stiff dough with one part middlings and two of corn meal. Of course this will make a large quantity, but if it be baked as bread and crumbled for the chicks, it will be all they will require, while it will keep for quite a length of time. It should be fed four times a day, and in addition the chicks should have green food. If preferred, the mixture may be made in small quantities at a time

by simply soaking the ingredients over night and allowing the mixture to boil in the morning, then thickening and cooking in the shape of bread.

Boiled Grain for Fattening Fowls.

It has long been a custom with French poultry raisers to cook the grain fed to fattening fowls. This is done by boiling it in water until soft enough to be easily bruised between the fingers. At this stage the grain has swollen so that the farina, splitting the membrane which surrounds it, gives a bursted appearance. Poultry feeders generally know that fowls prefer the cooked grains to dry food, and that they thrive better and fatten quicker upon it. There is also a decided gain in the bulk of food treated in this way, and its nutritive value is increased, as the following shows:

Four pints of oats boiled will fill a pint measure seven times.

Four pints of barley boiled will fill a pint measure ten times.

Four pints of buckwheat boiled will fill a pint measure fourteen times.

Four pints of maize boiled will fill a pint measure fifteen times.

Four pints of wheat boiled will fill a pint measure ten times.

Four pints of rye boiled will fill a pint measure fifteen times.

Rice increases in bulk considerably more than either of the six grains mentioned above. It is fed more to fowls now than formerly, as it is generally believed that it tends to whiten the meat. Some poultrymen claim that no saving is made in boiling the food, notwithstanding its increase in bulk, as there seems to be a corresponding lessening of its sufficing properties; that seven pints of boiled oats will be consumed in the same time and by the same number of fowls as four pints of the dry grain. On these "pints" we shall be pleased to have the experience of our readers. Doubtless most of them will agree that a partial diet of cooked food is best for fowls, even though it effects no perceptible saving in the amount it takes to produce given results. It occurs to us that even admitting that it takes no less of the cooked, if the fowls fatten quicker and thrive better, it is a matter of economy to use the boiled rather than the dry grain.

Feeding and Laying.

The best of feed sometimes fails to induce the hens to lay. This is not because the fowls do not get enough, but because it is not the kind they desire. It may be feed consisting of everything that serves to satisfy the demand for egg material, and yet no eggs will be the result. There are several causes for these complaints, one of the principal being the fact that a plentiful supply of pure fresh water is not always within reach, and unless water is plentiful the fowls will not lay. Water being the principal substance in an egg, it cannot be limited. Unless the water can be procured for the egg the fowl cannot lay. And in cold weather it must be so situated as to be either protected from freezing or else have a little warm water added to it occasionally. Now this is a troublesome job in winter, but water will freeze on cold days, and consequently is useless to the fowls when in a frozen condition. The feed, however, even when of the best quality, may not give satisfaction. In that case, when no eggs are being derived, change it entirely for three or four days. Give something entirely different in the morning from that previously given, even if inferior, but still give whole grains at nights in cold weather, for then the fowls go on the roost early in the evening, and have to remain in the coops until daylight, which is nearly thirteen hours, and so long a period demands the solid food in order to keep them warm during the long cold nights. Whole corn and wheat is best for them then, but in the morning any kind of mixed soft food makes a good meal for a change. The changes can be made by using good clover hay, steeped in warm water. After being chopped fine, slightly sprinkle with meal, and feed warm, which will be very acceptable. A few onions chopped fine will also be highly relished. Parched ground oats or parched cracked corn is a splendid change of food for a few days from the ordinary routine of every-day. It stimulates them if fed warm, and is a good corrective of bowel complaints, especially if some of the grains are parched till burned. The matter of feeding is to give variety, and if the food is of good quality also, a good supply of eggs may be expected at all times, but with good quarters and plenty of water the prospects will be better.

How to Raise Chicks.

The best hens for bringing out chickens are Wyandottes and Plymouth Rocks. Some varieties will not sit for the purpose at all, such as Leghorns, Spanish and Houdans. How such fowls perpetuate their species, if their eggs are not hatched by other fowls, we do not know, unless, indeed, that if left to themselves in a natural state, where the eggs which they lay would not be gathered every day, but left in the nests, they might, when nests get full, take to sitting on them. In a domestic state, however, such varieties seldom get broody, which compels people who wish to breed from them to keep a few fowls of another kind to hatch their eggs, March, April and May are the best months to hatch chickens, but eggs may be set even in January by those who have houses and wish to have well grown chicks in the summer, either for exhibiting at shows or for early laying. The risk of losing the young broods, however, during cold weather, and extra care and attention they require, certainly do not in ordinary seasons repay the trouble of rearing them. Some varieties may even be very successfully reared later than the months mentioned, owing to the rapidity with which they grow to maturity. Leghorns are perhaps the fastest growers, often beginning to lay before they are four months old. If an increase of eggs is desired in the poultry yard, before large sums of money are expended in the purchase of good layers we would recommend the keeping of no hens after the second year. Three bushels of meal will keep eight hens and one hundred chicks the first month, four bushels the second month, and five bushels the third month.

Feeding for Eggs and for Market.

At the season when fowls are being marketed, all the poultry cannot be fed alike. Those intended for sale should be separated from those that are to be fed as layers.

The food for the market fowls should consist largely of corn, and should be given often and plentifully, while too much exercise is not desirable. The hens, on the contrary, should not be fat, and should be fed only sparingly of corn or fat-producing material. If the laying hens are allowed in the yard with those for market, they will soon become worthless, so far as producing eggs is con-

cerned, and will be more profitable if shipped off with the others. And yet we can point to many who feed all their fowls alike, making no distinction and giving no thought to the real object they have in view.

These little matters of management are the turning points of success in poultry. The breeding stock-laying hens must be kept differently from the fattening stock. The horses, cows, sheep and hogs receive proper consideration in such matters, and the poultry is no exception, though the rule is overlooked so far as its application to them is concerned. It is a loss of time and also expensive in not feeding properly, and we trust the advice given will be regarded.

Hens in Wet Weather.

The damp, wet seasons are more injurious to the fowls than is the cold, dry weather of winter. Dampness is the source of one-half the diseases. It is not so much the amount of water they come in actual contact with, as the constant humidity of the air and dampness of their surroundings. Damp weather means an accumulation of mud and filth in the yards and coops, which is always in a state of decomposition and a source of annoyance. To avoid this difficulty the coops should be cleaned daily and the floors sprinkled with fine, dry, land plaster or dry earth. The yards should be drained, and every precaution used to turn the water away. In the case of chicks they quickly succumb to dampness. The moisture is constantly being evaporated, thus carrying off the animal heat. The same is true of adult fowls. They do not get wet as far as the water passing through the feathers on their backs is concerned, but the under parts of their bodies have no protection against the water on the ground, which soaks in and chills them, the result being roup and other diseases which arise from colds. A few pinches of red pepper in the food is excellent for them at such times.

Milk for Hens.

Fanny Field thus expresses herself as to the food value of milk for hens: "I quite agree with the correspondent of the *American Poultry Yard*, who declares there is no feed on earth so good for fowls and chicks as milk in some form. For very young chicks we make the clabbered milk into Dutch

cheese, and use the whey to mix feed for other fowls and chickens. From the time they are a week old till sent to market for broilers, our early chicks have all the milk, sweet or sour, or buttermilk, that they can drink. If the home supply of milk falls short of the demand, we buy skim milk at two cents a quart, and consider it cheap at that. For laying hens in winter there is nothing better than a liberal supply of milk. A pan of warm milk, with a dash of pepper in it, every morning, will do more toward inducing hens to lay in cold weather than all the egg-food in creation. For fattening fowls, we find that boiled vegetables mixed with milk and barley or corn-meal will put on flesh at an astonishing rate. Don't be afraid to give milk to fowls or chicks.

From the time when the chicks are given the first feed up to within the last day of the old fowl's life, milk may be safely and profitably given."

Vigor in Chickens.

The number of complaints that eggs do not hatch are legion, and every season witnesses failure from many different causes. The chief difficulty in the way of securing strong, healthy chicks is usually lack of vigor in the breeding stock. Although each year the chicks show inherited weakness, yet the miserable scrub roosters may be seen on every farm. It may be safely claimed that there are some who do not care anything about the kind of rooster used, and yet upon the characteristics of the male depend the uniformity and excellence of the chicks. In-breeding is so generally allowed as to make it a matter of surprise that eggs hatch at all. It is comparatively cheap to change the males every season. We do not mean that such changes can be effected by simply trading eggs with a neighbor, for in that manner but little new blood is brought into the flock, but by purchasing eggs or males from a good strain of pure breeds. If eggs are purchased, of course a year's time will elapse before the breed so introduced can be made serviceable, but it is a cheap mode of making a beginning. The chicks from a strong, vigorous, pure-bred cock will be uniform in appearance. They will be nearly all alike, and the eggs from hens running with such a cock will usually hatch well. One-half the chicks that die in the shell are too weak to work their way out before they perish, and the apparent mystery is not difficult of solution.

Combination Summer Foods.

Corn should be left out of the food altogether during the summer, as it is too heating and largely conduces to fat. If the hens are fed twice a day, the meal in the morning should be composed of whatever is intended for them other than whole grains. An excellent mixture is ten pounds of ground oats, three pounds of bran, two pounds of middlings, and two pounds of ground meat (or meat in any shape). Scald with boiling water, and add a teaspoonful of salt for every twenty hens. A tablespoonful of the mixture in the morning is enough, as it should be the aim not to give as much as the hens require, so as to compel them to work during the day. If it is desired to give them a noon meal let it be grass, which is better for them than any kind of concentrated food. At night, whole wheat or oats should be given.

By combining the food as directed, it will furnish the hens with all they require, as the compound contains the elements desired for egg production.

If the hens are to be fattened for market give corn and cornmeal plentifully, and feed four times a day. Be careful not to keep the laying hens in the same yards with those which are intended to be sent to market.

Utilizing Bulky Refuse.

A large amount of valuable material may be utilized if cooked. Pea-pops, string-beans, apples, squashes and many other articles, if placed in a pot and boiled until done, will furnish a quantity of food that is really more serviceable than too much grain. Ducks and geese may be kept at but little expense by such mode of feeding, while turkeys and chickens will appreciate the change at once. Turnips and carrots, if cooked and fed to all kinds of fowls, will furnish a cheap and nutritious diet, promoting the health and preventing too much fat. In feeding such material no grain is necessary except at night, when whole corn, wheat and oats should be given. One of the most valuable foods is cooked potatoes and sour milk. If this is fed, being first thickened with ground oats, it will cause the hens to lay more eggs than when an exclusive grain diet is given. Fowls should have plenty of bulky food if they are to be made profitable.

Value of Bones.

Poultry breeders do not seem to appreciate the great value of bones for their fowls, and but a limited few ever make use of them for this purpose. No matter whether the birds are confined or not, they are sure to be benefited by a moderate quantity of bones, though those that are kept in close confinement need them most. Nearly every family of any size has refuse bone enough from the kitchen to afford the poultry quite a treat from time to time, and when this is not the case, or when the supply runs short, enough can be procured each week from the nearest butcher at a very small price, many butchers being glad to get rid of them. These can be crushed by using a large stone and a heavy hammer, though there is now a very good and cheap mill made for the purpose—costing but \$5.00 without legs and \$7.00 with legs—which pays for itself several times over during the season, where large flocks are kept, as it not only grinds and crushes bones, but also oyster shells, corn, etc. The bones crush best when dry, and should be reduced to about the size of a small pea.

Soft-Shell Eggs.

If your hens lay soft-shell eggs it is an indication that there is a lack of lime in the food. They should have ground shells or bone, with a change of food. But the soft-shelled eggs do not happen because the hens are not supplied with lime always. It is often due to the hens being too fat, or from lack of exercise. In such case the food should be reduced to grass during the day and oats at night, giving them, however, plenty of litter of some kind in which to scratch. It is the poor condition and the over-fat condition that causes many of the difficulties with poultry. Whenever you get a soft-shelled, misshapen or double-yelked egg, or the eggs do not seem to hatch, you may conclude that your hens are too fat.

Imperial Egg Food.

Prof. Jordan has analyzed what is known as the Imperial Egg Food, and gives the proportions as follows: Moisture and organic matter 16.05 per cent, mineral matter 83.95 per cent, nitrogen 1.00 per cent, carbonate of lime 55.6 per cent, bone 14 to 17 per cent. The 83.95 per cent of mineral matter include the carbonate of lime and bone, probably, while the

nitrogen is included in the organic matter. To make the above intelligible, the mineral matter consists of oyster shells and bone, while the organic matter may consist of pepper, fenugreek, blood, dried meat of ground linseed meal. Hence, 10 pounds of the egg food would consist of about the following: Ground shells 6 pounds, ground bone 2 pounds, ground meat $1\frac{1}{2}$ pounds, fenugreek $\frac{1}{2}$ pound.



Care and Management.

Treatment of Young Chicks.

As a general rule, writes Mr. G. M. T. Johnson, of Binghamton, N. Y., do not disturb the chicks for the first twenty-four hours after their birth, if the hen will stay on the nest. The little things will not take any harm if they do not eat for the first forty-eight hours. The most they need is brooding. At this period they get more strength from it than from food. As a preventive of vermin rub a little fresh grease of any kind, say the size of a pea, on the top of the chicks' heads or backs. Do not put sulphur on the hen or chicks, as it will get in their eyes and poison them.

For the first week stale bread soaked in milk or water, or hard-boiled eggs chopped fine, is best. Feed onions chopped fine, and let there be handy some ground oyster shells or pieces of crockery pounded fine. Indian meal when uncooked is bad for young chickens. It swells and hardens in their crops. Indian pudding seasoned with black pepper is good for the first six weeks. As soon as they can eat it, cracked corn or wheat is better for chicks than meal. They do not waste as much, it does not get sour, and one can have it near by them so that they are not obliged to feed so often. Do not rout the little chicks out in the morning before they wish to go. Do not let them out in the wet. Feed little and often, especially before they retire. Little chicks are frequently fed in the morning and not again till ten o'clock, then they eat too much. They are stuffed one hour and starved the next. By this means the chicks become stunted and otherwise diseased. Keep water near them in dishes so shallow that they will not be drowned. Do not set the coop on the cold, damp ground. If early in the season put the coop in a barn or shed with a floor to it. Little chicks need to be kept warm

and dry. When they stand on the cold ground all night they are likely to be sick the next day, and soon the whole brood will be dragging their wings on the ground, peeping piteously for a few days and then dying. Do not let them out doors in the rain, but let them out of the coop or the uneasy mother will step on them. It is a mistake to put straw in the coop. The little chicks get their feet entangled and then the hen treads on them. Fine coal ashes are good in the coop. Later in the season, after the ground gets dry and warm, put the coop on soft ground if it is convenient, and sprinkle powdered sulphur over the ground. Change the position of the coop frequently.

It is not best to take the hen away from the chicks too early. As long as the chicks will brood, permit it. Warmth, good brooding and protection from the weather are better for chicks than good food, and the latter is very essential. Many a promising lot of chicks is ruined by getting chilled at night. As soon as the hen is taken away the chicks must be protected from the cold. It is a good plan to place the hen and chicks in the house where you wish them to stay after they are weaned. They will run out from there, and when the hen leaves them they will huddle together and so keep warm.

Do not furnish roosts for chicks. Oblige them to sit on the floor until nearly grown. Crooked breast bones are often caused by roosting too young. A great mistake, often made, is the trying to raise too many chickens on the same range of ground.

Many or few, they will wander about so far away from the coop and no farther. The ground over which they run will furnish naturally about so much in the form of bugs and worms, which are very conducive to the health of the chickens. If this is divided among a large flock each will get only a small portion. The larger ones will tread on the smaller and the chicks will grow slowly and be inferior.

It depends upon circumstances whether or not to allow the hen full range. She will pick up many luxuries for her chicks, but if she is a roamy, uneasy body she will worry the chicks to death by dragging them around. As soon as possible, cull out all inferior and defective specimens, thus giving their room to others. Select such fowls as you wish for keeping over. This requires experience and judgment, as many an awkward, inferior looking chick develops into a fine bird.

As soon as the young cockerels begin to worry the hens and pullets, it is best to put them in a yard by themselves. For the larger varieties, Brahmas and Cochins, it is best to set very early in the season, as it takes so much longer for the chicks to mature. March and April chicks do better than later ones. They are large enough when the ground opens to make war on bugs and worms, which are then very plenty and so desirable for the growth of the chick. They get well feathered out by the time nights are cold in the fall.

The Hatching Period.

Setting hens should have a daily run. Do not remove them forcibly from their nests, but let the door be open every-day at a given hour for a certain time while the attendant is about. Perhaps for the first day or two you may have to take them gently off their nests, and deposit them on the ground outside the door. They will soon, however, learn the habit and come out when the door is open, eat, drink, have a dust bath and return to their nests.

While hens are off their nests some people dampen the eggs with lukewarm water. It is claimed that moisture is necessary, and that the chicks gain strength by the process. This may be correct, and in very dry weather, perhaps, necessary. It is generally, however, a mistake to meddle too much with nest or eggs; the hen is only made restless and dissatisfied by so doing. While the eggs are hatching out it is best not to touch the nest. It is very foolish to fuss the old bird and make her angry, as she may tread on the eggs in her fury, and crush the chicks when they are in the most delicate stage of hatching.

Picking off the shell to help the imprisoned chick is always a more or less hazardous proceeding, and should never be had recourse to unless the egg has been what is termed "billed" for a long time, in which case the chick is probably a weakly one and may need a little help, which must be given with the greatest caution, in order that the tender membranes of the skin shall not be lacerated. A little help should be given at a time, every two or three hours; but if any blood is perceived stop at once, as it is a proof that the chick is not quite ready to be liberated. If, on the contrary, the minute blood vessels which are spread all over the interior of the shell are

bloodless, then you may be sure the chick is in some way stuck to the shell by its feathers, or is too weakly to get out of its prison-house.

The old egg shells should be removed from under the hen, but do not take away her chicks from her one by one as they hatch out, as is very often advised, for it only makes her very uneasy, and the natural warmth of her body is far better for them at that early stage than artificial heat. Should only a few chicks have been hatched out of the sitting, and the other remaining eggs show no signs of life when examined, no sounds of the little birds inside, then the water test should be tried. Get a basin of warm water, not really hot, and put those eggs about which you do not feel certain into it. If they contain chicks they will float on top; if they move or dance the chicks are alive, but if they float without movement the inmates will most likely be dead; if they (the eggs) are rotten they will sink to the bottom. Put the floating ones back under the hen, and if, on carefully breaking the others, you find the test is correct (one puncture will be sufficient to tell you this), bury them at once.

Chicks should never be set free from their shells in a hurry, because it is necessary for their well-being that they should have taken in all the yolk, for that serves them as food for twenty-four hours after they see the light, so no apprehension need be felt if they do not eat during that period, if they seem quite strong, gain their feet, and their little downy plumage spreads out and dries properly. Their best place is under the hen for the time mentioned.

When all are hatched, clean the nest completely, and well dredge the hen's body with sulphur powder; give her the chicks, and place chopped egg and bread-crumbs within reach. The less they are disturbed during the first two or three days the better. Warmth is essential, and a constantly brooding hen is a better mother than one which fusses the infant chicks about and keeps calling them to feed. Pen the hen in a coop and let the chicks have free egress. The best place to stand the coops is under sheltered runs, guarded from cold winds, the ground dry and deep in sand and mortar siftings. Further warmth is unnecessary if the mothers are good; and if the roof is of glass, so as to secure every ray of sun, so much the better. Cleanliness of coops, beds, flooring, water vessels and food tins must be absolute. The

oftener the chicks are fed the better, but food must never be left. Water must be made safe, or death from drowning and chills may be expected. The moment weather permits, free range on grass for several hours daily is desirable, but shelter should always be at hand.

• Eggs for Hatching.

It is often a problem with some why they at times secure good hatches from a portion of the eggs placed under hens, while but poor results are obtained from other sittings. In the first place, in a majority of cases, the trouble is with the *eggs* and not with the hens. For hatching purposes, especially in the winter, the eggs must be collected as soon as they are laid, in order to prevent them from becoming chilled, for extreme cold is fatal to the germ. No monstrosities in eggs should be used, such as those large enough for two yolks, or that are pointed at both ends. Ordinary, smooth, medium-sized, well-shaped eggs should be selected, and the fresher the better. The nest in winter should be made in a warm location, which is not exposed to drafts, nor is dampness essential, though a moist nest is better for the summer. Avoid giving the hens too many eggs to cover. Common consent has adopted thirteen eggs as a sitting, no matter whether the hen is large or small, but it is more economical in winter to place only ten eggs under a hen, as she will be enabled to impart more heat to a smaller than to a larger number, as a full nest sometimes does more injury than one but partially filled, owing to the larger number of eggs that become exposed, there to remain until they in turn are changed to the center of the nest by the hen. In extremely cold weather, an egg so exposed is destroyed by the low temperature, but if the hen succeeds in covering a smaller number, she will save the difference in the cost of the eggs required, and also hatch more and stronger chicks. It would be well if the eggs were tested after being under the hen a week. The incubator operators understand this, and why should not the same practice be followed with sitting hens? It is a very easy matter. Make an egg tester by pasting paper boards together, or by using thin boards, if preferred. A box should be made so as to fit over a lamp globe; say a square box, with a round hole on top and an oval hole on one of the sides. Place the box over the lamp, allowing chimney to pass through the hole on top;

now darken the room, using no light but that from the lamp; hold each egg to the oval hole on the side, and look through the egg at the light. If the eggs are a week old they will appear dark, should they contain chicks, the upper part or large end, appearing clear: this clear space around the inside of the large end is the air sack (or air bladder, as some term it). Below this air sack the contents of the egg will appear dark. Should the egg contain no chick, it will appear clear; and if compared with fresh eggs, will show the same appearance; therefore, always use a fresh egg for comparison. Put the dark eggs back in the nest, and keep the clear ones, cook them and keep them for feeding the young chicks.

How to Start and Stock a Hennerly.

The subject of poultry keeping, writes Dr. A. M. Dickie, is attracting attention now from parties who have not hitherto given it any notice. Not knowing anything about it practically, they ask for advice and information respecting methods of procedure. To answer such inquiries privately would require too much time and work, and we take advantage of the opportunity presented here to discuss the general principles underlying the subject in a public way.

Poultry is kept for two ends: First, to supply eggs, and second, to furnish flesh for food. In some sections one of these ends is sought, and in others the different one, while occasionally a man may be found who wishes to combine them both. It will be well, then, for a person to determine what he wants to produce in his poultry yards. If he wants eggs mainly he will select a different breed or breeds than would be chosen to produce market poultry.

A person not knowing the habits or characteristics of the different breeds or varieties, may easily make a mistake in selecting the proper one for his purpose. Since the furore in poultry fancying and poultry journalizing has run so high, admirers of particular varieties have been so enthusiastic in praise of their favorites that every good quality which could be enumerated has been claimed for their specialty. The best layers, the smallest eaters, the quietest, the best foragers, the handsomest, the most profitable, in every way the most desirable fowl, etc., is claimed respectively by breeders of nearly all the different kinds of fowls.

Most every one should know—but everyone don't—that no one breed can excel in all these characteristics applied to all breeds. Some will lay more eggs in a given time, say a year, than others; some will make more meat than others; some will sit better than others; some are better mothers than others; some are hardier than others; some will eat more than others; and so we might go on to the end of the list of qualities, because no one breed is best for all purposes. But if a man knows what he wants to produce in his poultry yards, his liability to make a selection is much reduced, unless he makes the mistake at the beginning of wanting to secure all the ends at once for which poultry is kept.

Where one wishes to make a specialty of egg production, he must leave meat production to be pursued by somebody else, and the reverse. The best layers are not best for table use, and, conversely, the best for table use are not the best layers, no matter who says so. Most people understand that the best milch cow will not make the best beef cow at the same time; and that the best brood sow will not be best for pork. The same principle is applicable to a chicken. The juices, fats, salt, aroma, etc., that go to make savory, toothsome beef in the one case go off into the milk pail, in the other it goes into the egg basket. It is not a very difficult matter to make a good sandwich, provided one has the material, but it can't be made all of meat or bread or butter, though meat, bread and butter are all necessary. So if you want eggs you must have one kind, and if you want meat another kind of chicken is necessary.

A Use for Feathers.

To utilize the feathers of ducks, chickens and turkeys generally thrown aside as refuse, trim the plume from the stump, inclose them in a light bag, rub the whole as if washing clothes, and you will secure a perfectly uniform and light down, excellent for quilting coverlets and not a few other purposes.

Preparing Nests for Sitters.

An important thing is to learn how to prepare the nests of your sitting hens. Try to make the nests to fit as nearly as possible the shape of the hen's body. Use damp earth, as it is

easily shaped, and it serves the purpose of furnishing the eggs with needful moisture. The curve of the nest must be neither too great nor so small as not to keep the eggs near together. In case trouble may be expected from rats, cover nest, hen and all, every night, with a box having wire cloth at the end or sides to let in air.

Don't use hay, as the seeds in it will bait the mice, and the hens will be likely to scratch for hay seed, and thus break the eggs. Straw well *broken* and *made soft*, is the best material. Don't cut the straw in a machine, as that fills the nest with sharp points that prick the hen and annoy the young chicks.

Now keep in mind that the nest of your sitter must be kept free from lice during the whole term of incubation; keep the whole building free from them, nests and all. Any preparation that will aid the poulterer in annihilating lice in his houses and runs, or which will infallibly destroy these insidious enemies of domestic poultry that cause our birds so much annoyance and harm, is "a good thing" to have at hand by all breeders and fanciers who have a care for the comfort, health and welfare of their poultry stock.

There are several methods adopted and plans in vogue to help the fowl-keeper in this matter. Tobacco, snuff, whale-oil, sulphur, petroleum, carbolic powder and acid, coarse pepper siftings, etc., are applied upon the fowl, under the feathers or upon roosts and in the nests, with various results, more or less successful in the course of time.

Common, cheap, powdered sulphur you can always get at the druggists'. Scatter it in the nest and under the feathers of the sitting hens, and you will not be troubled with lice. If the lice be left to get over everything and the nests are full of them, the best way is to clean out and burn all the old nests, whitewash the house and nest-boxes inside and out, make clean fresh nests, sprinkling them well with sulphur, and your hens will reward you for the comfort you have afforded them. To rid the hens of lice, dust them well with flour of sulphur at night. The heat of the hen's body in the nest will cause the sulphur to continually give off a smell, which keeps lice and other vermin at a respectful distance. Provide dust baths where your sitters can have access to them when they come off to feed. You are supposed to have laid up a stock of dry road dust, which you should collect in summer or early fall and store it where it will not gather damp-

ness and freeze, and keep it dry and throw in a little every week to make up for what the fowls throw out while they are exulting over your generous care, and you may be sure it will be a paying item. But if you have neglected this seasonable provision, and the ground is now wet, substitute coal ashes. This material will do very well.

Spring Breeding of Poultry.

An English correspondent of the *Country Gentleman* thus expresses himself: "Where it is intended to produce early chickens for market or for home use, there should be a lot of stock birds for that purpose separate from those which are to produce the layers and breeders. In nearly all countries the breeding of early chickens is about the most profitable part of poultry keeping. The prices which can be realized the first four months of the year leave a large margin to the producer and where the farm is suited from its position and soil to early breeding, and there is a good market for the fowls within reach, this is a work that we should recommend the breeder to go in for. He may hatch from pullets' eggs if that be necessary, as it most probably will, for though the chicks will not be so hard as would be those from hens' eggs, yet as they are to be killed off, no harm will be done. The birds will be fed up at the right time, and whatever weakness may be in them will not be transmitted to any other than themselves. To secure the chickens being ready in time, they should be hatched in November and December. The former will be ready for market in February, the latter in March or April, these being the best months of the year, so far as prices are concerned. This set of breeding pens may be broken up in December, unless a few more chicks are to be bred in January, and the ground may, after a short rest, be occupied by the regular breeding stock, which need not be mated until the middle or end of January. It is most desirable that the birds which have laid eggs for the production of the early chickens should not be relied upon for those from which the breeders and layers are to be obtained. In the case of pullets especially, the strain upon the system from the production of so many eggs will have weakened them, and this would be injurious to the later progeny. These, if of a sitting variety, may be used for that purpose, as they become broody, and

this will give them a much needed rest. But if non-sitters, they may be rested by the discouragement of laying for a time. The plan here recommended will be found best suited to the production of healthy, strong, large fowls. I do not wish my meaning to be mistaken. I believe in early breeding, *i. e.*, early in the year, so as to get the hens to lay before the winter sets in, which they will not do if allowed to hatch late; but I do not believe in the production of stock birds at an unreasonable period of the year, and from pullets. February is early to set eggs, but not too early. April—the month when most farm hens in this country, if not well attended to, begin to sit—is getting late, and May is, under ordinary circumstances, *too late*.”

Cleanliness in the Poultry House.

It is a disagreeable task at all times to clean out the poultry houses and coops, but, like every other undertaking, much depends upon the systematic manner in which the work is performed. We have seen persons labor hard all day, in the midst of filth, with shovel and hoe, cleaning the poultry house, and when the job was finished but little appearance of cleanliness was added to it. There is an easy, neat, effectual way of cleaning the poultry house, which, if adopted, removes the dread and disgust of the work, and makes it a pleasure instead of an annoyance. The first consideration is the construction of the floors. Dry dirt will not answer, for the reason that it absorbs the impurities, and the filth can only be removed with the dirt, thus entailing the necessity of changing the entire floor and substituting fresh material. We have found the use of the broom to be the cleanest, easiest and best method of removing the droppings, but in order to do so the floor must be hard. Wood is the best material, but a wooden floor is liable to become a harboring place for rats unless it is well closed underneath or raised sufficiently to allow a cat or terrier to run in and out under it. When this is done the cold air comes up into the poultry house in winter and makes the wooden floors objectionable. Cement is better, for it not only prevents vermin from entering, but also the drafts. The cheapest way to make such a floor is to take one barrel of lime, two of sand, and one of gravel, one bushel of cement and two gallons liquid coal tar. Mix the in-

redients dry, then add water and spread evenly on a hard surface which has been graveled. The coal tar may be brought to a proper consistency with coal oil. It keeps away lice and colors the cement. Let the floor remain undisturbed for twenty-four hours, and add another coating in order to stop the cracks.

Tar in the Poultry House.

Poultry dealers seem to have failed to discover the value of tar. It is very useful and valuable in many ways. Some breeders tar their poultry yard fences in preference to whitewashing them, though we do not like to see it done, for it gives the surroundings such a gloomy, forbidding look. It undoubtedly contributes largely to the durability of the wood, protecting it from the ravages of storm and time. It is in the poultry house, however, that the value of tar is the greatest, for it conduces greatly toward healthfulness. When that scourge of the poultryman, cholera, makes its appearance, we would advise, first, a thorough cleaning of the house; next, a generous application of Carolina tar on all the joints, cracks and crevices of the inside of the building, and then plenty of fresh whitewash properly applied. The tar absorbs or drives away the taint of disease, and makes the premises wholesome. The smell is not offensive; in fact, many people like it, and it is directly opposite to unhealthy. To vermin, lice, etc., the smell of tar is very repulsive, and but few will remain after you have tarred the cracks, etc. A friend of ours in Maryland was once troubled with chicken cholera, and by adopting the above in connection with removing affected fowls, he soon put a stop to its ravages. A small lump of tar in the drinking water supplied to the fowls will be found beneficial, provided it is the Carolina tar, which is very different.

Keeping the Breast Bone Straight.

It is a well known fact that the heavier breeds of domestic poultry, like the Brahmas and Cochins, and especially the light Brahmas, are frequently injured by roosting on small or ill-contrived roosts or roosting benches, causing a curvature of the breast bone, when the birds are young and the bones very soft, tender and pliable. This deformity, while it does

not show the bad defects in breeding from such deformed birds, is an eyesore, and detracts considerably from the selling value of the bird, no matter how fine a specimen of the breed it may otherwise be. To remedy, in some measure, this tendency or irregularity, some of our breeders use very low roosting benches, in place of the high roosts of the old-style pattern. These benches are made with broad, rounded strips for the birds to rest on and cling to, and this generally prevents the bones of the breast from becoming deformed. The young of the Asiatics (Brahmas and Cochins) are, when young, very weak in the legs, causing them, when on the roost, to bear most of the weight on the roosting pole or strip directly on the breast bone, to relieve the strain on the legs. If the roosting poles are small or have sharp edges, it is sure to become painfully apparent in the curvature of the breast bones of the young birds, and to avoid it the roosts must be broad and rounded—say a 2½ inch strip, rounded on the upper side. This will be found about right. To avoid all possibility of trouble from curvature of the breast bones, quite a number of Brahma and Cochin breeders now do away with the roosts altogether for their immature and growing young stock, and bed the birds down with straw, the same as is done with cattle, etc., and in some cases with ducks and geese. The young chicks soon get to understand how to use their “low roosts,” and gather in on the straw every night as regularly and as orderly as do cattle or sheep.

While this bedding down is a good thing when properly managed, it must be removed and well aired each morning, and the house swept out. Just before roosting time, the straw is nicely spread in place again for the accommodation of the birds, and the same thing is repeated daily while the birds use this method of sleeping, which they are generally compelled to do until they have become fully matured, and the breast bones thoroughly hardened by age and maturity.

Importance of Gravel.

Sometimes many of the difficulties in the matter of keeping poultry may be traced to causes that are apparently very insignificant, yet they may for a long time cause much annoyance and trouble until the source of the evil is discovered. Failure to provide gravel is the cause of indigestion and

bowel diseases in some yards. On close, compact clay soils, gravel is scarce, and the hens, if confined, can find no substitute for it. Coarsely ground oyster shells may be of assistance, but they are too soft to fully answer the purpose; and, though gravel itself may be plentiful in the shape of small, *smooth* stones, yet to be serviceable, they must be *sharp*, as their action is purely mechanical. So important is the matter of such material known to some poultrymen that they frequently pound broken glass or earthenware for the purpose, which has been swallowed by fowls with benefit, but whether a large quantity of such material is injurious or not is undetermined, some claiming that they give the broken glass liberally, while others maintain that something depends upon the size and shape of the pieces swallowed. If pounded bone be fed, the hens invariably select the sharpest and most irregular pieces, and it is their choicest delicacy. Sand is not a substitute for gravel, but imperfectly sifted coal ashes are of assistance. By keeping sharp gravel before the hens they will thrive better, and to be without it is equivalent to a deprivation of food, as the process of digestion will not be complete unless the food is fully masticated.

Lime and Lime-Water.

Without lime, poultry breeders would indeed be in a bad way, for there could be no whitewashing done, and that is so necessary to cleanliness and appearance as well as to the preservation of the wood; while the vermin would be only too thankful to have it done away with, for it is so distasteful to them. Then there are the bits which are scattered in the houses, on the floors and around in the yards; these, too, would be greatly missed, for they keep things pure, sweet and clean, and free from foul odors which are so productive of disease. The hens, too, which lay such nice, fine eggs, would be at loss where to find material for their shells, and many a soft-shell egg would be the result. While, in its fresh as well as slaked state, it is so useful and beneficial in economic and profitable poultry management, lime-water is also of great use, though but few breeders seem to realize it. If it was more generally used there would be very few cases of the throat diseases, unless the diseases were of long standing or hereditary. It is very easily prepared, and will keep for quite

a while, if kept sheltered from the sun. Take a piece of fresh lime about as large as a cocoanut. Slake it well in a little water. When it is slaked thoroughly fill up the small tub or large bucket with water and let it settle, after which pour off the water for use.

How to Clean the Premises.

First remove all the contents—nests, roosts and boards for catching the droppings. Then slake some stone lime with warm water, and make a bucket of thick whitewash, to every bucket of whitewash adding a tablespoonful of carbolic acid. Apply it *thickly*, outside and inside and into every crack and crevice, not even overlooking the under part of the roof or the floor. With a sponge apply kerosene to roost poles, nests and boards, first cleaning them thoroughly, and set fire to them. They will only burn until the oil is consumed, while the fire is easily extinguished. This will destroy every egg or parasite on them. They may be again anointed with kerosene and placed in their proper positions in the poultry house. Fill the bottoms of the nests with dry earth, mixing a teaspoonful of insect powder with the dirt. Place finely cut hay over the dirt, and sprinkle a little insect powder and tobacco refuse in the hay. The house will then be clear of vermin. All filth must be carefully removed, while the old nests should be burned. The yards should now be spaded, so as to render them clean. By thus cleaning the premises disease may be warded off, the houses disinfected and rendered more comfortable for the hens and a larger number of eggs secured.

Nests for Sitting Hens.

Mistakes are made with the nests of sitting hens. Too many are made that are so small that the hen is unable to perform her duties of sitting down upon and stirring the eggs without smashing one or two. A roomy nest should be supplied—not too large—having a bottom of rather soft material resting on dirt, with plenty of straw well packed about the sides. Such a nest, especially early in the season, is very desirable, retaining as it does the heat for a much longer time than a carelessly made nest of loose hay in a box.

The best receptacle for a nest, where one has plenty of room, is an ordinary flour barrel. Cut in the side a hole large

enough for one hen to pass through, and then hinge a small door to open and shut at pleasure. The advantage of such a nest is that nothing can be more secluded. There are no draughts of cold air sucking through the cracks into the nests. They are easily inspected, if not made too deep, and there is ample space for any hen within the barrel. A door prevents the hen from looking out much better than a wire screen. A hen that cannot see all that is going on outside is less restless.

Material for the Dust Bath.

The dust bath is the toilet of the hen. With it she cleans her body and feathers, rids herself of vermin, and delights in the enjoyment it affords. In winter, however, when the ground is frozen hard, it sometimes becomes a difficult matter to provide the hens with a dust bath, especially if there are several flocks. In summer is the time to lay in a supply of dirt for the purpose. The dirt should be fine and well sifted, in order that it may be more completely adapted to the purposes intended. Wood ashes are unsuitable, owing to the caustic properties of the potash, which creates sores on the skin, should the weather be damp. Finely sifted coal ashes, entirely free from admixture with wood ashes, are excellent, but a full supply is not always obtained. The cheapest and easiest mode is to lay in a supply of dirt, either from the road or the field, but it should be perfectly dry and stored in a dry place, or it cannot be used when the necessity arises. In winter a box one yard square and six inches deep, filled within an inch of its top with the dirt is just what the hens will appreciate. The dirt may remain in the box as long as it is dry and clean, but should be removed at least once a week. By sprinkling a few drops of a solution of carbolic acid in the dust bath any unpleasant odors may be removed and the dirt rendered more acceptable.

How to Produce Layers.

Mr. L. Wright says: "In every lot of hens some will be better layers than others. Let us suppose we start with six Houdans—a cock and five hens. Probably out of this five two may lay thirty eggs per annum more than either of the others; their eggs should be noticed and only these set. By following this for a few years a very great increase in egg

production may be attained. My attention was drawn to this subject by a friend having a Brahma pullet which laid nearly three hundred eggs in one twelve-month, though valueless as a fancy bird, and the quality descended to several of her progeny; and I have since found instances which prove conclusively that a vast improvement might easily be effected in nearly all our breeds were that careful selection of brood stocks made for that purpose which the fancier bestows on other objects. It is to be regretted more is not done in this way, and having more room than I had, I hope myself to make some experiments in this direction shortly. I will say now that I am perfectly certain the number of two hundred eggs per annum might be attained in a few years with perfect ease were the object systematically sought; and I trust these few remarks may arouse general attention to it among those who keep poultry for eggs only, and who can easily do all that is necessary and without any knowledge whatever of fancy points or any attempt to breed exhibition birds."

Coal Ashes for the Hen-House.

A New Jersey correspondent of the *Prairie Farmer* says: "In the autumn and winter, each morning the ashes and refuse from our stoves, mostly from burnt coal, was sifted over the droppings from the roosts. This was a perfect deodorizer; and kept everything clean and sweet. I soon began to notice that the fowls were intently picking at the small bits of coal or slate, both in the sieve and that which had passed through it. Eventually they became very fond of the diet, evincing as much interest as would be expected by any choice dish set apart for their special delectation. I was sometimes alarmed for the throats as I saw them laboring with the large and ill-formed pieces; but they were always successful in their efforts. I suppose that beside their beneficial effect as triturants, they exert a good effect from the chemical constituents of the original vegetable matter of which the coal is formed. Suffice it to say, the flock has thriven and grown more healthy, and the layers have quite distinguished themselves in the production of eggs."

Eggs: How Increased.

If an increase of eggs be desired in the poultry yard, before large sums are expended in the purchase of everlasting layers,

we would recommend the system of keeping no hens after the first, or at most, after the second year. Early pullets give the increase, and the only wonder is that people persist, as they do, in keeping up a stock of old hens, which lay one day and stop the next. In some parts of Europe it is the invariable rule to keep the pullet only one year. Feeding will do a great deal—a surprising work indeed—in the production of eggs, but not when old hens are concerned. They may put on fat, but they cannot put down eggs. Their tale is told—their work is done. Nothing remains to be done with them but to give them a smell of the kitchen fire, and the sooner they get that the better.

Eggs and Pullets.

Unless you want a large proportion of cockerels do not sell all the largest eggs you can pick out. There are no means known by which the sex of eggs can with certainty be determined. Although many thought some sign indicated the sex, yet after repeated fair trials, all these indications have entirely failed with me, except the one which follows: With regard to the eggs of most of the feathered kingdom, if you pick the largest out of the nest, they are the ones that generally produce males, especially if they happen to be the first laid. Even in a canary's nest it is noticeable that the first egg laid is very often the largest, the young from it is the first out, keeps ahead of its comrades, is the first to quit the nest and the first to sing.

Road Dust for the Hennerly.

Collect a few barrels of dry earth, road dust, fine dry dirt in the cornfield or potato patch, or any where that is most convenient. This is a handy thing to have in the fall and winter for sprinkling under the roosts and on the floor of the poultry-house. It absorbs ammonia, keeps down smells, and keeps things shipshape. It will pay to attend to this when it can be so easily done. It costs but little, and is a real advantage.

How Nests Should be Made.

Eggs hatch much better if the nests are made by placing a cut turf, and shovel of mold, sand or ashes, in the the box or

basket, and on this a little short straw, than if straw only is used. In this way a convenient hollow is obtained that prevents the eggs rolling out from under the sitting hen. In cool weather the eggs are thus kept in a much more equable temperature than in nests made simply of loose straw.

Enemies of the Barnyard.

There is greater loss every season from enemies than from disease. The minks, hawks, owls, dogs and cats play havoc with the stock at a time when the farmer is not aware of it. The majority of farmers will agree with us when we state that during some seasons they feel certain they have hatched several hundred chicks, but when the chicks are ready for market, only one-half of them can be found. The farmer cannot tell where they have gone or how they were lost, but he knows that they are gone, though at what age or through which source always remains a mystery. The enemies work secretly. They carry off the chicks one by one, and the loss is so gradual that it is not noticed.

How to prevent such loss is not easily explained. No two farmers are situated alike, and the shotgun and watchfulness must be the safeguard. The greatest depredator is the family cat. She will often allow the chicks to roost on her back and eat with them from the same dish, for she knows that they are protected; but the peaceable and fraternal cat becomes a tigress when no one is looking, and many little chicks become her prey, while at the same time she professes to tenderly care for them. No cat can be trusted. All kinds of birds are the natural prey for cats. A cat *will* devour young chicks, no matter how well she may behave herself apparently. Rats are also very destructive, a single rat often killing every chick hatched, and he must be caught, even if all the floors have to be torn up, or it will be a waste of time to attempt raising chicks. Such rats are too sly for cats, traps or poison. They must be hunted down, and no expense must be spared until they are destroyed. Minks can be kept out of the poultry house, and so can the owls. Dogs usually kill chickens when they are half-starved and are ill fed. Foxes no longer do much damage near the barnyard. The chief enemies are the hawk, rat and cat, the latter being the most destructive.

The Best Rat Poison Made.

Wash seven quarts of wheat clean, soak ten minutes, and drain till thoroughly dry. Pulverize as fine as flour one ounce of strychnine in a teacup, pour upon this just enough water to dissolve it and grind with a round-headed bolt for five minutes, then fill the cup nearly half full of water, add brown sugar and stir until it forms a syrup as thick as molasses, which will fill the cup. To this add ten drops each of oil of anise and rhodium and stir well. Pour this mixture into the wheat, rinse out the cup with a little water and pour also into the wheat and stir the whole mass with a large spoon or paddle till every kernel of wheat becomes coated with the syrup. Put fifteen to twenty grains of the wheat in the runways of the vermin, and they will come to it from as far as they can smell it, and the poison being on the outside of the kernels they seldom get far away, but die in their tracks. Never put your hands into the mixture, either in making or using, and keep the wheat either in a can or a jar with a close cover, to prevent moulding and preserve the scent of the oils. Mark the jars in large letters, *Poison; Don't Handle.*



Turkeys, Geese and Ducks.

Raising Turkeys.

CROSS a bronzed gobbler with common hens, and allow six hens with each gobbler as a limit, though fewer are better. Each hen will lay from twenty to forty eggs according to management. The period of incubating is thirty days. Sixteen eggs constitute a sitting for a hen. Allow the young ones no food for twenty-four hours. Then feed often (but avoid over-feeding), give food at least every two hours until they feather. The reason of this is that the growth of feathers on young turkeys is very rapid and demands a constant supply of nutrition, hence a single omission of food for a few hours sometimes proves fatal. The feed at first should be coarse corn meal, which is added to a mixture of milk and eggs. This should be cooked, and an onion chopped up and added to it. After they are three days old, feed mashed potatoes, chopped onions, ground oats and eggs well mixed with milk, and cooked. Milk is always excellent. After they are a week old the eggs may be omitted, but a portion of cooked meat and a little ground bone should be allowed. They then may be allowed grain of all kinds (corn being ground), cooked vegetables and milk. The water should be fresh and clean, one quarter of a teaspoonful of tincture of iron to be given in every pint of water.

One of the secrets of raising young turkeys is never to allow them to get wet or chilled. The damp grass is fatal. Keep them in a coop with the hen for three or four days, and then allow them to ramble with her *on dry days only*, keeping them in a roomy place on the approach of damp weather. They cannot be confined like chicks, as it is not their nature, but if carefully watched until they are beyond danger they are very hardy and can take care of themselves. Do not attempt to raise turkeys unless you have ample room for them to forage

upon, as they are fond of straying off to long distances and easily fly over the highest fences. Keep the male away from the hens while the latter are setting, or he will eject them from their nests. When on the nest the hen sticks closely, and will nearly starve before she will leave it, consequently her food should not be neglected. Turkeys are subject to the same diseases as chickens, and the remedies in the case of one apply to the other.

There are seven varieties of turkeys—the Wild, Bronze, Narragansett, White, Black, Buff and Slate; the Bronze and Narragansett being the largest in size, sometimes attaining the weight of forty pounds. All varieties prefer to roost in trees, but may, by being hatched under barnyard hens, be taught to roost in the poultry houses.

How to Fatten Turkeys.

Nothing pays better to be sent to market in prime condition than the turkey crop. Many farmers do not understand this. Their turkeys grow on a limited range, getting little or no food at home through the summer, and if fed at all with regularity it is only for two or three weeks before killing. I see these lean, bony carcasses in the local market every winter, and feel sorry for the owner's loss. They have received a small price for their birds and a still poorer price for the food fed out. The average life of a turkey is only seven months, and the true economy of feeding is to give the chicks all they can digest from the shell to the slaughter. If they get all they can eat on the range, that is well. Usually this should be supplemented by regular rations when they come from the roost in the morning and two or three hours before they go to roost at night. The food may be slack in the morning, so that they will go to the range with a good appetite, and fuller at night. They should be put upon a regular course of fattening food as early as the middle of October, when you propose to kill the best birds at Thanksgiving. The younger birds should be preserved for the Christmas and New Year's markets. They continue growing quite rapidly until midwinter, and you will be paid for the longer feeding. There is nothing better for fattening than old corn, feed partly in the kernel and partly in cooked meal mashed up with boiled potatoes. Feed three times a day, giving the warm meals in the morning, and feeding in troughs with

plenty of room, so that all the flock may have a chance. Northern corn has more oil than Southern, and is worth more for turkey food. Use milk in fattening if you keep a dairy farm. Feed only so much as they will eat up clean. Cultivate the acquaintance of your turkeys as you feed them. No more charming sight greets your vision in the whole circle of a year than a large flock of bronze turkeys at call from their roosts on a frosty November morning. New corn is apt to make the bowels loose, and this should be guarded against. There is usually green food enough in the fields to meet their wants in the fall, and cabbage and turnips need not be added until winter sets in. If the bowels get loose give them scalded milk, which will generally correct the evil. Well-fattened and well-dressed turkeys will bring two or three cents a pound more than smaller birds. It will not only be better for the purse, but for your manhood, to send nothing but finished products to the market.

Geese.

Geese can be fattened cheaply, as they will eagerly consume chopped turnips or any other kind of cheap material at this season, but to get them fat they should have corn also. A goose should not be too fat, as such are objectionable, but they should be fat enough to present an excellent market appearance. The young geese that have not fully completed their growth, cannot be fed too liberally, as they will not become extremely fat until matured. They do not bring as good prices as turkeys, but their flesh is preferred by many, owing to its being free from dryness, and although dark in appearance, is juicy and of good quality. The feathers are an important item, and will pay for the expense of preparation. Considering their freedom from disease, and their willingness to consume all kinds of food, they are very profitable to those who have large flocks.

A goose will lay about twenty eggs, but may be induced to lay as many as thirty if she is removed from the nest, and with good management will hatch two broods. A large goose will cover at least a dozen eggs, and she usually begins to lay about the middle of February or during March. The gander is a faithful attendant, sometimes keeping close to his mate while she is incubating, for the purpose of driving away intruders. The period of incubating is about twenty-nine days.

Grass is highly relished by geese, and they may be pastured, but such location should be of a character suitable for close cropping, as geese endeavor to eat tops and roots together. They are very voracious, and eat anything that is fit for food.

They may be plucked for feathers two or three times during the summer, and will yield about a pound of feathers per annum worth from sixty to seventy-five cents. Geese will pair if the proportion of sexes is equal, but three geese may be permitted with one gander as a limit. They are easily restrained within enclosures by clipping their wings.

There are eight varieties of geese—the Wild, Toulouse, Embden, African, White Chinese, Brown Chinese, Egyptian and Sebastopol. The Toulouse and Embden are the largest, and sometimes weigh sixty pounds per pair. The latter is entirely white, and also more prolific than some other breeds. A cross of the Toulouse gander with the Embden goose makes the largest bird for market. The other breeds are more ornamental than useful. The management of goslings should be similar to that of young ducks.

Breeding Geese for Feathers.

It is not genenerally known that this is an important business in West Virginia, but such is the fact. In that state, especially in the western part, the water courses are numerous but not navigable, and railroads are undeveloped. Often fifty or sixty miles must be traversed to reach a railroad station, and in such locations breeding geese for feathers is found to be very profitable. Several pickings are made in a season and the crop of feathers is duly baled and sent to market by wagon, which is usually at some station where agents are ready to receive it. We allude to the feather crop of West Virginia in order to state that geese may be made to prove equally as profitable in other localities as well, especially at points possessing limited railroad facilities, as feathers are not heavy enough to interfere with easy hauling, even when there are full loads on the wagons. Geese are practically self-supporting, and work on a pasture or on a pond. They come up regularly at night, protect their young vigorously, and subsist where other fowls would starve, having on competitors except ducks, which they exceed in size.

The carcass of a goose is also salable, the only objection to it being the dark color of the flesh, but a goose is juicy and not dry like a turkey.

Require Shade in Hot Weather.

They require shade from the hot sun. Early-hatched goslings do the best. from the first of April the till first of May is good time for them to hatch. Feed them bread, curd and meal dough. There is no danger of feeding them too much. When reared in this way, they will live and thrive, so that in six weeks they may be turned with the old geese.

Toulouse Geese.

My mode of raising Toulouse geese, says a writer in the New York World, is about this: I select my geese to breed from, and pen them in a small lot that has some grass in it; pen about three geese to one gander. Feed on any kind of grain, with scraps from the table, apple and potato parings, cabbage or any kind of vegetables. Give them a shelter and good nest. Gather the eggs as soon as laid, to keep them from freezing. As soon as they lay twenty eggs, we set them under four hens, in a good warm place. As fast as they hatch take them out of the nest and keep them in the house three or four days I then, if the weather is warm, put them out on the ground with a hen, in a small close pen. If the weather is bad, keep hen and the goslings in the house in a box. Feed on corn bread. Give them a cabbage head to eat instead of grass. Give them water in something just large enough to drink out of, so they can't get into the water. A tin cup is best. After the gosling are three weeks old they are enclined to ramble. To prevent this, put them in a small, close lot, with plenty of grass. Give them water to drink; keep feed in their coop, because they want feed every two hours in the day. Pen them at night in a dry shelter, to protect them from rain and the owls, till after they are picked the first time. Pick them when they are about nine weeks old. Leave all the feathers on the back and shoulders, and the large ones on the hips to hold up the wings. In about six weeks from this time pick them the second time, taking all the feathers. Feed well till goslings are grown; then it will not require much to keep them. We never allow our goslings to go to running water till after they

are picked the first time, Give both goslings and old geese plenty of sand, ashes and charcoal while penned. We never allow our goslings to get out in the cold rain till after they are feathered.

Management of Ducks.

"Any calculation as to the return to be expected by those who keep ducks," says an experienced breeder, "depends entirely upon the possession of a suitable locality. They are most likely to be kept with profit when access is allowed them to an adjoining marsh, where they are able in a great measure to provide for themselves; for if wholly dependent on the breeder for their living, they have such ravenous appetites that they would soon, to use an emphatic phrase, 'eat their heads off.'" No description of poultry, in fact, will devour so much, or feed so greedy. The excursions allowed them must be limited to a short distance, otherwise they will gradually learn to absent themselves altogether, and acquire rather wild habits, so that when they are required to be put up for feeding or immediate sale, they are often found missing and difficult to find.

Ducks, too early allowed their liberty on large pieces of water, are exposed to so many enemies, both by land and water, that few reach their maturity; and, even if some are thus fortunate, they are not disposed afterward to return to the farm-yard and submit quietly to regular habits. They may be kept in health in small enclosures, by a good system of management, though we fear, with very little, if any, profit, which is the point to which all our advice must tend. There is no doubt that ducks may be made profitable as eggs producers, but the quality of their eggs, and the extra labor required to obtain them (for, unless they are got up every night and confined, they will drop their eggs carelessly here and there, where many of them will not be found), will not allow them to compete with the hen, in that capacity. Also, a duck lays when eggs are most plentiful, while hens' eggs may be produced at all seasons.

The best mode of rearing ducklings depends very much on the situation in which they are hatched. On hatching, there is no necessity of taking away any of the brood, unless some accident should happen; and, having hatched, let the duck retain her young upon the nest her own time. On her mov-

ing with her brood, prepare a coop and pen upon the short grass, if the weather be fine, or under shelter, if stormy. Keep a wide and shallow dish of water near by them, and renew the water quite often. Their first food should be crumbs of bread, moistened with milk. Curd, or eggs boiled hard and chopped fine are also relished by and are good for them. After a few days, Indian meal, boiled and mixed with milk, and if boiled potatoes, mashed, be added, all the better. All kinds of sopped food, buckwheat flour, barley meal and water, mixed thin, worms, etc., suit them. They are extremely fond of angle worms, grubs and bugs of all kinds, for which reason it may be useful to allow them a daily run in the garden. All the different substances mentioned agree with young ducks, who show, from their most tender age, a voracity which they always retain. It is necessary, to prevent accidents to take care the ducklings come regularly home every evening, and precautions must be taken before they are allowed to mingle with the old ducks, lest the latter should ill-treat and kill them, though ducks are by no means so quarrelsome and jealous of newcomers as common fowls always are.

We have not bred any ducks for a number of years, but some of our experience with them is as follows: In 1878, we tried the experiment of rearing ducks without having the water facilities which many consider necessary to make the undertaking successful. We bought of the Aylesbury variety, one drake and three ducks, in the fore part of February, placed them in the our back yard, and let them run with the rest of the fowls; fed them regularly three times a day, and kept placed for their convenience at all times, an eight-quart basin full of water. We did not coop them with our other fowls. Understanding they would do better in dark coops or roosts, we therefore made for them two tight tent coops of rough boards, with small, open doorways in front, in the most secluded place we could find in the yard, between a couple of trees and surrounded with shrubbery. The three ducks commenced laying about the last of February and continued laying pretty regularly until the latter part of August or first of September. In April, we set a hen on thirteen duck's eggs, which brought off twelve young ducks. We did not set any ducks, but continued to use hens for that purpose, and at the close of the season were rewarded

with a flock of sixty-eight young ducklings, which brought in the fall, when well fattened, an average of \$1.50 per pair, saying nothing of the large number of eggs used for culinary purposes. In rearing young ducks with hens, we placed near the coops, which are always located in the vicinity of the pump, a small pan or water-tight box, sunk in the ground to receive the waste water from the pump, which answered the purpose as well as if they were given a pond of water to swim in, and fretted the hen mother much less. In fattening them, we gave them plenty of boiled potatoes mixed with cooked Indian meal, made into a pudding. We fed but little corn or oats. They paid us well for all our trouble and expense, as they doubtless would if the experiment were tried on a larger scale.

There's Money in Ducks.

How much will it cost to raise a duck eight weeks old? is the question I have asked parties who have been in the business for years. Most of them say 25 cents, some 20 cents and a very few 30 cents. Now, I thought I would try a little experiment and satisfy myself, as to just what it would cost to raise a duck to the age of eight weeks, at which age those engaged in the dressing of ducks for the Boston markets will buy them. I purchased 425 common mixed ducks' eggs, from different parties. These were put in the Reliable incubator, June 1. They were tested in one week, and a good many infertile ones were found, reducing the number to 340. There were hatched from these 323 live ducks, some of which being weak, soon died. They were put in two broods and had artificial heat just ten days; none died after they were six days old. I raised nearly 300 of them and at the age of eight weeks they were sold to the carts. These ducks were confined to small yards, and could get nothing to eat except what was given to them. They were fed on corn meal, fine feed and ground beef scraps, and the last two weeks some cracked corn. Ground oyster shells were kept by them all the time. The cost of feed and oil used in hatching was $11\frac{1}{4}$ cents each. These ducks were not stinted in feed, being quite fat when sold. The price paid for meal was 62 cents per bushel, fine feed \$1.20 per cwt., and \$2 25 per cwt. for scraps. Now these parties that I talked with about raising ducks allow them to run in pastures, where a portion of their feed is picked up,

and they can raise a duck for 2 cents less than I did, the price of grain being the same. I have 50 nice Pekin ducks now, and shall be prepared another season to raise a better quality of young ducks for market. I feed laying ducks the same as I do the laying hens.

Rapid Growth of Ducks.

We have experimented with a brood of young ducks, of all kinds—common, Rouen, Pekin and crossed—in order to observe their growth. When very young they were attacked by cramps, but it was discovered that by giving them tepid water to drink, instead of that very cold, they were no longer afflicted in that manner. Hence, never give cold water to very young ducks. At birth, ten ducks, together, weighed one pound; a week later the same number weighed two-and-a-half pounds; the second week the ten had reached four pounds, or nearly half a pound each when two weeks old. Ducks should have a place on every farm; not the little quacking didappers, or puddle ducks, but some of the high-toned, well-bred, upper tendom of the web-footed class, easily raised, and when cooked and served, more easily eaten than any other flesh. These fine breeds are not only large, but they lay a large number of eggs, superior to hens' eggs for cooking. Ducks for market should be liberally fed from the first and marketed early. They are enormous eaters and grow rapidly. Nothing that wears feathers can equal the improved duck as a table fowl.

Stealing Her Nest.

Why does the hen that steals her nest usually bring out full broods of strong, healthy chicks? Many have endeavored to solve the problem, but comparison may assist us to a certain extent. In the first place, a hen that lays a clutch of eggs in a stolen nest, is usually in a healthy condition, is not too fat, takes plenty of exercise, and her nest is prepared naturally with a view to prevent disturbance. When we place eggs under hens, we know nothing of them. The hens from which they are procured may be excessively fat, and we handle them several times before placing them in the nest. The birds, as a rule, do not like a disturbance of the eggs, especially if they are handled; many of them leaving and abandoning the nests and eggs, if interfered with. But we

handle eggs freely, expose them in every possible manner to extremes of heat and cold, and do not stop to consider their uniformity. The hen stealing her nest, has a clutch of eggs uniform in every respect, as they are laid by her, and consequently, if one is good the whole should be equally so. But take the eggs that are placed under hens or in incubators, and they are not uniform, some being large, some small, others dark and thick-shelled, while quite a number may be imperfect.

The hen stealing her nest has every advantage in the quality of her eggs, as she attends especially to the matter of having them fertilized instinctively. Her chicks all having the same father and mother, are equally as vigorous and strong. But find her nest, take away from the hen the eggs that she has laid, and put others in place of them, and it will prove that it is not so much in how, where and when she sits, as in the vigor of the chicks, for the reason that we stated—the excellent physical condition of the hen running at large, and laying under the most favorable conditions. When we become so situated in our poultry enterprises as to be able to collect large numbers of eggs from vigorous, healthy stock, there will be no cause to point to the truant hen as an example. To be successful we must begin with the laying hens, for when they are in condition, the other difficulties will be very easily overcome.

Killing Poultry.

A correspondent of the *Poultry Yard* gives the following plan. It is so simple and excellent a one that we do not hesitate to advise its use: "I have been killing poultry with the knife, and in a different manner from that which I have usually practiced. I cut on the back side of the neck, just back of the ear or head, my object being to sever the jugular vein. There being two, one on each side of the neck, it would be best to cut the one near the carotid artery, when only one side is cut, thus severing both vein and artery, which I believe is on the right side. On hens I cut both sides of the neck, and, when the blood stopped running a stream, penetrated the brain by running the knife point through the groove in the top of the mouth. I saw no twitching or quivering of the muscles. Soon after I commenced to pluck the feathers with both hands. They came off very easy. The birds

were quickly stripped, and without any breaking and tearing of the skin. Spring chickens I cut only on one side, and do not tear them any to speak of. I must say that the method worked better than I expected. The objection to scalding in this section is that the fowls soon turn dark, and will not sell for as much as dry plucked." If the fowls are for immediate sale in a home market, and have been killed and dressed as above, their appearance will be improved by a quick immersion in hot water. An old poultry seller told us he always treated dry picked turkeys and chickens to such a bath, and got two cents more on a pound for it.

The Best Layers.

It is not an easy matter to know which of your hens are the best layers. We admit that some of the hens will lay more eggs than others, yet to find out which are the more profitable the record cannot cease with a few hens. Nor is the greatest profit derived from the hens that lay the largest number of eggs, but from those that lay the greater number when prices are high. There is more profit in two dozen eggs at thirty cents per dozen than from three dozen at twenty cents a dozen, although the sum—sixty cents—is the same for both lots, for the reason that the *cost* of two dozen is less than for the three dozen. A hen may lay well from April to July, and apparently be an extraordinary layer because she lays an egg every other day, but after awhile she may do but very little; and another hen, that does not seem to be doing her duty, slowly reaches the number and still keeps on laying. The record should be therefore kept for a year, and an average for each month made. The best hens for the year should then be retained as breeders, from which to hatch the next season's pullets, and they should be mated with a cockerel of a good laying family, so as to secure better progeny than the parents. The prices, number of eggs laid, number of chicks hatched and amount in value produced by each hen, should be noted, so as to be assisted in the selection by a knowledge of the characteristics of each, and merit will be the guide.

To Get Rid of Skunks.

To rid your poultry yard of skunks, purchase a few grains of strychnine, roll it up in a ball of lard, and then throw it at night outside the yard, where the animals' tracks are seen.

As they are very fond of lard, they will swallow it quickly, and in the morning you will find your enemy dead. But you must be careful so shut up the dogs and cats, as they are equally fond of lard. It is the easiest way to kill any vermin, as they die very soon. Skunks will kill and eat full-grown ducks and hens and suck their eggs whenever they can gain entrance into the poultry house.

Medicated Nest Eggs.

Cut a hole in one end of an egg as big as this capital O. In the other end put a pin hole. Now blow out the contents and you have the empty shell. Next mix plaster-of-Paris and water together to the consistency of cream, add a few drops of carbolic acid. Pour this into the shell until it is filled, and in twenty-four hours it will be dry and you will have a medicated nest-egg. Five cents worth of plaster-of-Paris will make a dozen, and that amount of carbolic acid is sufficient to scent a hundred.

Pigeons.

Few are aware that pigeons can be kept at a large profit. One has only to note the quotations of 30 to 75 cents a pair, or dine at a first-class restaurant and pay 75 cents for a squab, or note the item of 900 dozen squabs consumed in 90 days at a first-class hotel, to be convinced that the common Rock pigeon is by no means to be despised.

Mr. — informs me that his squabs averaged $22\frac{1}{2}$ cents each, and he keeps several hundred old birds. He keeps them housed during seeding time; then they fly at will and gather a large share of their living, he feeding them at four o'clock, or thereabouts. The males sit during the afternoon to liberate the females. By feeding them at four o'clock the females are sure of a full crop to sustain them during their long vigil of incubation. We believe that 500 pigeons would pay a man well for his year's work in caring for them.

Some of the fancy pigeons are very large. Of the Runt breed, Dr. Cook showed a pair at New York that stood twenty inches high and measured eight inches across the backs.

Using Thermometers in Incubators.

Just where to place the thermometer in an incubator has been almost as much of a problem as operating the incubator

itself. Some who have tried the method, insist that the bulb of the thermometer should come in contact with a *fertile* egg, as the fertile egg, containing a chick, is warmer than one that is infertile, but in comparing the plan with others it has not always proved successful. The best hatches have been secured by placing a thermometer between the eggs, the upper end slightly elevated, and the bulb half way between the top and bottom of the eggs. If the bulb of the thermometer touches the eggs the heat will be entirely influenced by the heat of the growing chick, which is always fluctuating, at times rising very high and at others decreasing, the heat from no two chicks being the same. That from a strong chick will be greater than that from a weak one. We can safely claim, however, that when the bulb does not touch the eggs, but lies between them, it will more correctly represent the temperature of the egg drawer and the heat will be more uniform. Above all things, however, be *sure* that your thermometer records correctly, as that is the most important matter.

Why they Lay.

You ask if our hens lay in winter, and if so how it happens. They do, and this is the way we feed, which explains "how it happens:"

For three mornings in the week we feed about six quarts finely chopped hay (timothy and clover mixed), six quarts boiling water, and two quarts each of bran and middlings. For two mornings the flock is fed with four quarts of small potatoes and turnips boiled, mashed and mixed with two quarts each of bran and middlings. For the other two mornings they have a ration of the same amount of bran and middlings mixed with scalding hot skim milk.

For the noon ration we give a basket or two of chaff from the barn floor scattered in the feed room. At night we give three pints of wheat, or when very cold about two quarts of corn heated in the oven. We sometimes substitute one quart of oil meal for the two quarts of middlings in the morning ration. The above is for a flock of forty-five, composed of Plymouth Rock and Brown Leghorn pullets.

In addition to the foods named, the hens have all the bones from our beef and pork, oyster shells, and the scraps from the lard and tallow.

Eggs for Hatching.

Importance of Selection.

WHEN incubators are used there is often great difficulty to secure a large number of eggs, and operators are disposed to accept any kind that they can get, the result being that some eggs hatch while others fail. Then the incubators are condemned as at fault, when really the cause is due to the eggs. When we consider that no two eggs are alike, and that the eggs in an incubator may come from as many as a hundred hens, it is plain that the matter of collecting and selecting eggs is one of the most important connected with hatching chicks for market.

When an egg drawer is filled with eggs it requires but a glance over them to notice the great dissimilarity of sizes and shapes. While they are in the egg drawer is the time to pick them over, for they can then be easily compared. All eggs of odd and peculiar shape, very small, very large, or which differ from the normal egg, should be removed and the drawer filled again. The object should be to secure eggs of normal size, smooth shells, regular shapes, and as near perfect as appearances will indicate. There is no way of knowing the fertile from the infertile eggs until they have been in the incubator four or five days, so as to test them with an egg tester.

When collecting eggs from neighbors examine the hens in yards. If they are clumsy and fat the eggs will mostly be infertile. The male should be active and vigorous. If the hens are on a free range and are enabled to exercise on clear days, it is an advantage, and it is better to endeavor to learn if the stock is inbred or unhealthy.

One of the best plans to adopt is for you to procure pure-bred stock, and when your young males are matured, go to

each neighbor and trade one of your males for his scrub and sell the scrub. It may be expensive for you at the time, but not if you expect to use eggs for hatching from those yards, as you will thus improve the stock for your benefit and add vigor by the out-cross, thus securing better hatches, more rapid growth of chicks, higher prices and larger profits.



Hatching by Machine.

Two Dozen Rules.

FIRST — Hens that lay in winter cannot produce as fertile eggs at that time as in the spring, for the cold season prevents exercise, the hens become fat, and the pullets are not as fully matured, while the male, if he has a frosted comb, suffers from cold or becomes too fat, and is unserviceable.

SECOND — The hen seldom sits in winter, hence she and the incubator do not conflict.

THIRD — Eggs are sometimes chilled in winter. When you buy them you take many chances.

FOURTH — Do not use extra large eggs or small eggs. Have all eggs of normal size and of perfect shape.

FIFTH — In winter the hen will not hatch one-half of her eggs nor raise one-third of her chicks.

SIXTH — When chicks die in the shell the chances are that too much draft of air came over them. It will occur at times with the best sitting hens. This trouble will appear with stock that are overly fat, and often with young and immature pullets.

SEVENTH — Dry, warm nests in winter, and moist nests in summer is an old proverb, hence the moisture depends on the season. Less is required in the incubator in winter.

EIGHTH — As the chicks progress in the eggs they give off heat, hence be careful of the lamp, hot water or whatever the source of heat.

NINTH — No currents of air can pass through an incubator without a plentiful supply of moisture, but in incubators that have no currents but little moisture is needed.

TENTH — Too much moisture covers the egg and excludes the air from the chicks within the egg.

ELEVENTH — Do not labor under the delusion that a young chick is always dying in the shell for lack of fresh air, and that it must have as much as a young animal.

TWELFTH — Do not take out the chicks until you believe all are hatched. Leave the chicks in the incubator. If you take them out the heat will suddenly drop, and you will also let in the cold air on the eggs. Never disturb the eggs when chickens are hatching.

THIRTEENTH — Eggs will be aired sufficiently when they are turned. It is of no consequence to cool them.

FOURTEENTH — If the chicks do not hatch out by the twenty-first day, your heat was too low.

FIFTEENTH — If the chicks begin to hatch on the eighteenth day, your heat was rather high.

SIXTEENTH — Do not put eggs in at different periods during the hatch, and do not hatch ducklings and chicks together.

SEVENTEENTH — The same rule applies to hens, ducks, turkeys and guineas as regards heat and moisture.

EIGHTEENTH — Never sprinkle eggs. It lowers the heat instantly, and it sometimes kills the chicks in the shells.

NINETEENTH — If the incubator shows moisture on the glass do not open the egg drawer until it is dry. Cold air and dampness kill the chicks, the heat being lowered by rapid evaporation,

TWENTIETH — The reason that the hen that steals her nest hatches so well is because you do not give her all sorts of eggs, such as large eggs, small eggs and eggs from old hens and immature pullets, such as you put in the incubator.

TWENTY-FIRST — Kick away the curious visitor just when your eggs are hatching.

TWENTY-SECOND — No matter how much you read, experience will be the best teacher.

TWENTY-THIRD — Have your incubator warm when you put in your eggs.

TWENTY-FOURTH — A child cannot manage an incubator, all claims to the contrary. Incubators are not toys. Don't turn a man's work to a boy.

Points on Hatching in Winter.

Some Valuable Hints.

THE first thing necessary to insure success in the hatching of chickens in winter, or at any other season, is to procure the eggs from a flock of healthy and vigorous fowls. In such a flock there should be about one-tenth as many males as hens to produce the best results.

Use nothing but perfectly formed eggs with smooth shells. They should be kept where the temperature does not fall below fifty-five degrees nor rise above sixty-five. By turning them three times a week they may be kept two weeks before setting. In very cold weather they must be gathered several times a day to prevent them from getting chilled.

Have the incubator in a room where the temperature will not fall below sixty degrees. If kept in a colder room, when the egg drawer is opened, the eggs receive a chill which kills the chick in the shell.

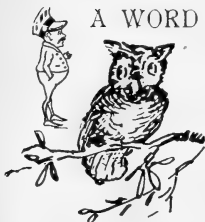
Place the eggs in the incubator, which has been previously heated to one hundred and three degrees, then keep an even temperature. Should it reach one hundred and seven or one hundred and eight degrees for a short time it will do no harm, but the more uniform the temperature the better will be the result. The eggs should be turned twice in twenty-four hours, at regular intervals, till the nineteenth day, after which they should not be disturbed except to turn those which may be pipped on the lower side, to prevent the chick from smothering. No moisture should be given them the first eight days, then a small amount should be supplied. The last four or five days moisture should be given freely. Of course, the manner of furnishing moisture and ventila-

tion depends upon the kind of incubator that is being used, but both are very important factors in the artificial hatching of chicks.

When the eggs have been in the incubator ten days they should be tested by holding to a bright light. A very satisfactory egg tester consists of a tin pipe, which rests upon the globe of the lamp. It should be a trifle larger than the chimney, with a three-quarter-inch hole opposite the flame, and smaller ones near the bottom of the tube to admit air to the lamp. All eggs that are not fertile should be removed from the drawer. They may be easily distinguished by the clear appearance that they present, while the fertile eggs will appear dark, showing plainly the air bubble at the large end.

After the chicks commence pipping the shell, the incubator should not be opened any more than is necessary.

The above suggestions have been made on the basis of three years' experience in hatching early chicks with incubators.



A WORD TO THE WISE

There is big money in poultry raising when conducted on business principles. If you are shrewd and alive to your best interests it behooves you to stir around and give this matter the attention it deserves. Get a good start and you are bound to be successful. An equipment furnished by the Reli-

able Incubator & Brooder Company will enable you to get out of the old rut and turn what has been regarded as a "side issue" into the most promising and profitable feature of the farm, requiring the least exertion and giving the best returns.

Questions and Answers.

Pointers on Poultry.

FOLLOWING are a number of replies brought out in response to queries from practical poultrymen in various parts of the country, which embrace a range of subjects that come within the experience of almost every chicken fancier, and from which some valuable pointers may be gleaned:

QUESTION — Will a damp cellar do for an incubator?

ANSWER — Yes, it will be an excellent place. In a damp cellar you will not need any moisture pans in the machine, as the natural moisture of the cellar air will be sufficient.

QUESTION — Do you know of any egg tester by which you can tell a fertile egg before putting it in the incubator?

ANSWER — There is no way of knowing if an egg is fertile before being used for incubation.

QUESTION — Please inform me how hot or cold it must be in the incubator to spoil the eggs.

ANSWER — Lower than 40 is injurious, and 116 for an hour will spoil them. These are extremes.

QUESTION — What should be the size of a house in which to raise 75 to 100 chicks to three pounds? and will a house built of rough boards and covered with good roofing be warm enough?

ANSWER — A house 10x12, divided into two pens 6x10, will do very well. A brooder will comfortably accommodate 50 to 60 chicks till six weeks old, at which age they should be graduated from the brooder to a house not freezing cold, but comfortable enough. A well built house, covered with a good roofing will do nicely.

QUESTION — How about turning eggs once over daily, or half over twice a day?

ANSWER — They should be turned *half over* only, to bring the cool side up to the heat, and we think it wiser to turn twice a day. One incubator maker advises turning three times a day, but we are satisfied that twice a day is sufficient with ours.

QUESTION — I am using an incubator and have had very good success until recently. Now I find many full grown chicks dead in the shell. What is the cause?

ANSWER — Too much heat probably, although it is not certain that it is the fault of the incubator; the same thing happens sometimes with hens. It may be the fault of the hens laying too rich (fat) an egg, and the chick growing too large for the shell, and cannot turn himself to break his way out. This is liable to happen where fowls are lazy and have little exercise.

QUESTION — Does it do harm to handle the eggs, such as testing them or changing them from one machine to another after they have been in the incubator three days?

ANSWER — Not if they are handled carefully and not exposed to cold air too long. If testing eggs in a cool room it is well to warm a couple of blankets folded to be a little larger than the egg tray. Cover the untested eggs with one warm blanket and spread the other over another tray, and slip the eggs under as fast as tested. In this way chilling the eggs can be avoided.

QUESTION — Can I get too much moisture in the machine? After the eggs had been in three days I set two baking pans of water under the egg trays and sprinkled the eggs twice a day.

ANSWER — Yes. Especially if it is put in by sprinkling. Here is probably the cause of your failure—the constant chilling twice a day to which you subjected the eggs probably killed the germs; some early, others half grown, and others which were hardier and stronger, survived nearly long enough to escape. The pans were enough for moisture.

QUESTION — How many chicks would a brooder house 50 feet long and 12 feet wide accommodate? Could I heat it with a stove?

ANSWER — Five hundred if it was divided into 10 apartments of 5 feet by 8, leaving a 3 foot walk on the north side. That would give you ten hovers which would accomodate 50

chicks each. You would want a stove with a water jacket and outflow and return pipes for the hot water. A simple stove will not answer. You want the heat where it will keep the chicks warm, and hot water pipes are the thing.

QUESTION — How long should chickens be kept in the brooder before they can do without artificial heat?

ANSWER — Until about six weeks old, but it depends on the season and weather.

QUESTION — Will eggs hatch with a constant temperature of 100 to 102 degrees?

ANSWER — Yes. But the hatch will be delayed and the chickens weakened somewhat. The *nearer* the temperature is kept to 103 or 104 degrees the better.

QUESTION — Are the conditions the same with the incubators in hatching duck eggs as with hens' eggs? That is, shall I keep the same moisture and heat in the incubator for the duck eggs as for the hens' eggs?

ANSWER — The conditions are the same, only the duck eggs want but little moisture the first three weeks. The temperature required is the same.

QUESTION — Have I a right to build an incubator and infringe on patents if I do not offer it for sale? Can I build a hot water incubator, heat it with a lamp, and not infringe on patents? I wish to regulate it by expansion of the water in the tank.

ANSWER — You cannot make a patented article even for your own use. You can make and sell any incubator that is not patented.

QUESTION — Will it do harm to have the heat rise to 106 degrees in an incubator after the eggs have been in three days or more?

ANSWER — No. The temperature may rise to 108 or even to 110 without injury unless allowed to remain at the highest point six or eight hours, and frequently the best hatches are obtained with irregular changes from 90 to 112.

QUESTION — How often, how much and what time should moisture be put in a two-lamp incubator? Capacity, 200 eggs for chickens.

ANSWER — The measurement of moisture is impossible. Water evaporates more rapidly when warm than when cold.

Everything depends on how much air flows in, the temperature, stage of incubation, cubic inches of space in incubator, etc. No one can know how much moisture to give. It can only be determined by time of year and location where the hatching is done.

QUESTION — What is the cause of incubator chicks being ruffled in feathers? Some act as if benumbed, stretch out their necks and lay down.

ANSWER — May be due to several causes — bottom heat, lice, dampness or insufficient heat in brooder.

QUESTION — Two weeks hence I wish to remove chicks then twenty-five days old from indoor brooder to enclosure outside. Will it be practicable without artificial heat?

ANSWER — It would be very risky, as most chicks at that age are still unfledged; consequently liable to be chilled of a cold night, or in a cold storm. We do not like to move out our chicks till they are about six weeks old, and it was so cold throughout the first half of May we didn't move any out till they were almost eight weeks old.

QUESTION — If I keep a pan of water in my incubator and wet sponges under the egg drawer (which has a cloth bottom) is there any need of keeping wet sponges in with the eggs?

ANSWER — The water pan alone is sufficient. Incubator managers use much less moisture than a few years ago, and are experimenting towards still less, some advocating none whatever. In our 600-egg machine, instead of putting in the four moisture pans at the start, and having moisture all the hatch, we put in two pans only for the last week or ten days, and find it ample. Some that we know put in no moisture till the eighteenth day, and then only a wet sponge in each tray.

QUESTION — How early can I start an incubator, and will I have to keep it where it won't freeze, or would it be better to let the hens set and take care of the chicks that early?

ANSWER — October is usually the time to begin. It should be in a place of moderate temperature. You cannot use hens that early, as they may not be broody.

QUESTION — I had some Brown Leghorn pullets that were hatched last March and begun laying in August and continued till October, when, to my surprise, they begun to shed

their feathers; they haven't laid since, and while they are healthy and spry, their combs are pale and I fear they won't lay till spring. What is the cause, do you think? They were not too fat and apparently healthy.

ANSWER — This is not an uncommon occurrence. Our experience has been that pullets of the quickly maturing breeds, hatched early in the season, will lay a few eggs in the fall, moult late, and begin to lay again quite late in the season. For this reason we have been unable to endorse the advice so generally given, to hatch early pullets in order to get early winter and spring layers.

QUESTION — Some say that fowls that have cholera are not fit for breeding. What do you think about it?

ANSWER — Fowls that have had any serious illness are unfit for breeding because of their impaired vigor.

QUESTION — How long can eggs be kept good for hatching? Should they be turned daily, and should they be kept in a close room?

ANSWER — The fresher eggs are when set the better, but they can be kept some weeks, four to six, if carefully attended to. They should be kept in an even temperature of about 45 to 50 degrees (a dry cellar is best if not too cold) and should be turned (by gentle handling) every other day.

QUESTION — I have to keep my hens in an enclosure 20x50 feet, including house. How many hens can I keep in it and how much feed shall I give each hen? What kind of food shall I give? I keep them for eggs.

ANSWER — A flock of fifteen would, with proper care, find a comfortable home in the area mentioned during the entire year. In winter a much larger flock of layers might be accommodated. The larger the flock the greater must be the care taken of them. There is no fixed rule as to quantity or kind of food to be given. You will find different modes of feeding throughout these pages.



Around the Poultry Yard.

Facts Worth Considering.

LET the boys have a flock of fowls.
It is good policy to renew the litter on the floor of the feeding room frequently.
Observe how a flock will nestle on a well-littered floor in winter. A hint to the wise.

Long wattled birds should have water supplied in automatic fountains that have small drinking cups.

Warm messes for feeding in the morning should be mixed the previous evening and kept warm through the night.

There should be ladders from the perches to the floor where there are heavy fowls. The best form of ladder is a board with cleats nailed across.

Fowls need air, but not the kind that comes in a draft or a biting wind. Wind is next to water in the amount of discomfort and disease it causes.

A little grain scattered over the litter on the floor in the evening will induce the birds to begin their work early in the morning, and so help them to relish their breakfast.

The custom of the most successful turkey raisers is to breed only from well matured stock. When the breeds have proved themselves reliable they are kept for several years, and the young stock sold.

While fowls may live and, apparently, thrive on an exclusive corn diet through the winter, it is not the best diet to bring the flock out in good order for next spring's business. They need vegetables and meat also. The best is the cheapest in the long run.

Oats are excellent for laying hens.

Steamed rice is good for young chickens.

Geese should never be picked in cold weather.

A good hen should lay at least 140 eggs during the year.

Goslings grow more rapidly than any other kind of bird.

Egg eating is apt to be developed by too close confinement. It is necessary to feed meat in some form during the winter.

Puddles are not the proper sources of water supply for chickens.

Sugar beets, carrots and turnips are good winter food for poultry.

If turkeys are carefully managed they are profitable on any farm.

Cochins mated with Game or Brown Leghorn cocks make good crosses.

When hens are moulting the accumulation of feathers should be cleared out at least once a week.

Egg foods are those which contain lime for the shell, albumen for the white and carbon for the yolk.

Geese feather more rapidly when they have an abundance of fresh water and run on a green pasture.

A hen in her prime and properly cared for, will produce three times her weight in eggs yearly.

A good way of making poultry pay is to always have some ready for sale. In this way the market can always be met.

For fattening fowls quickly, broken rice has been found to be a valuable food and one that may be obtained at low rates.

Wheat is the best grain for poultry every day in the year, except when fattening for market, when corn should be used.

There is no reasonable excuse for keeping scrub fowls, when it is so easy to get well bred ones. Pure-bred fowls are more satisfactory. Few people will take good care of a lot of mongrel chickens, while if they had some modern beauties, they would treat them carefully and well, and be well paid for their trouble.



An Interesting Experiment.

On Ventilation.

WE HAVE made some interesting experiments on the subject of ventilation during the past season, being led to do so by seeing an article going the rounds that eggs had been hatched after being hermetically sealed up. Not being in the habit of jumping at conclusions, the experiment proceeded on the principle that we knew nothing about the subject but would make an effort to find out.

A tin box large enough to hold fifteen eggs was made and the eggs put in. It had a glass cover over one side, was sealed with putty so that it was perfectly air-tight, placed in an incubator and run for ten days, when the box was opened. Of all the vile abominable smells ever tasted—it was so thick it could be tasted as well as smelled! The smell passed off in a few minutes, when the eggs were examined and thirteen out of the fifteen found with dead chicks that appeared to have died about the seventh day of incubation. The eggs were turned by turning the box upside down, and thermometers in the box under the glass showed the proper heat.

Twenty-four small boxes large enough to hold one egg each were then made, with two side glasses. The eggs were packed around the corners of the box with cotton so they would not tumble about any, and then sealed up tight. By holding the box up to the light and looking through it the eggs could be tested and it could be seen at just what time they died.

Part of the boxes were only sealed on one side and a small opening was left at the top of the other side. Part were packed on one side, all but a hole on the edges of the opposite

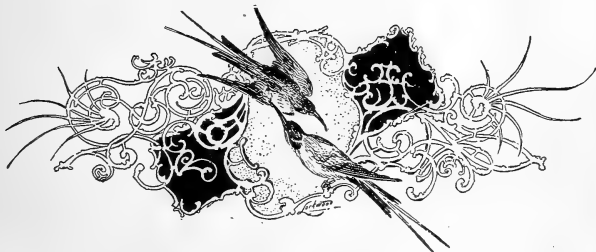
side and these were turned so that one hole would be at the top side and one at the bottom, thus allowing a circulation or draught from the bottom to top.

Of these that were sealed tight not an egg had a live germ after seven days. The boxes that were tight at the bottom and open at the top — a small opening only — kept alive until the twelfth or fifteenth day, then they died. As the chick grew, the gas was made faster than it could escape, and so they died.

Those that had a hole in both top and bottom edge of the boxes lived up to the nineteenth day and would have hatched had they been permitted

This proves several things most conclusively. First, eggs must have ventilation to hatch them. Second, an incubator perfectly air tight below and up to a little above the top of the eggs would not hatch, as the carbonic acid gas would accumulate and smother the eggs. Third, there must be some circulation where the eggs are. Fourth, eggs with live germs will produce enough carbonic acid gas to destroy life.

In lieu of turning the boxes that were sealed at the bottom, they were moved often enough to keep the contents well mixed, which is all that is required by the turning of eggs. The others were turned by turning the boxes upside down.

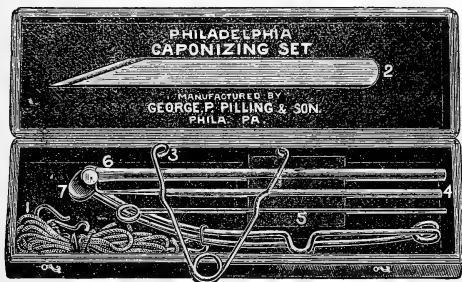






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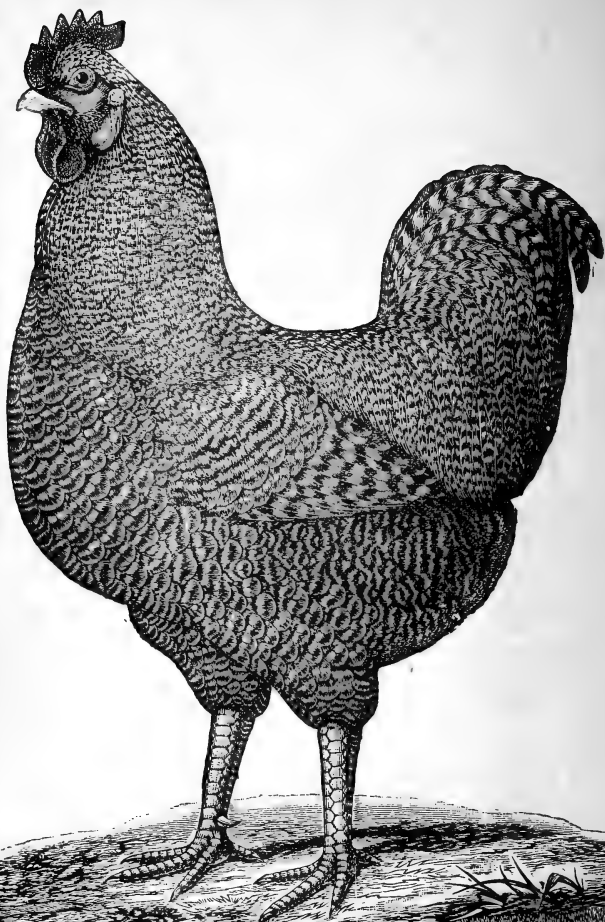


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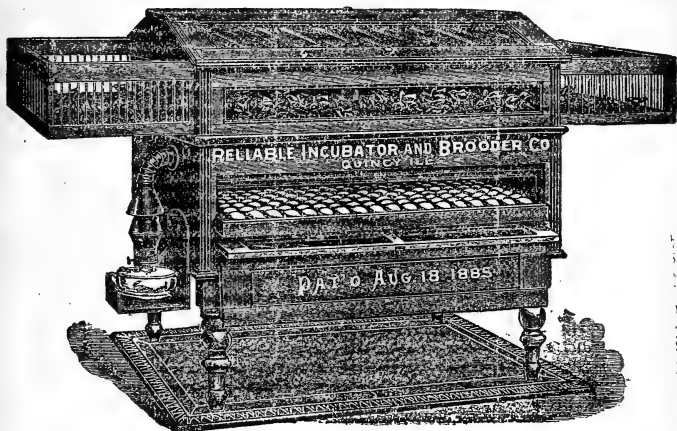
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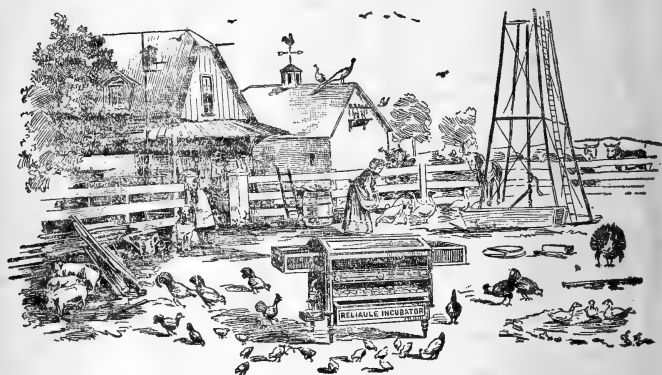
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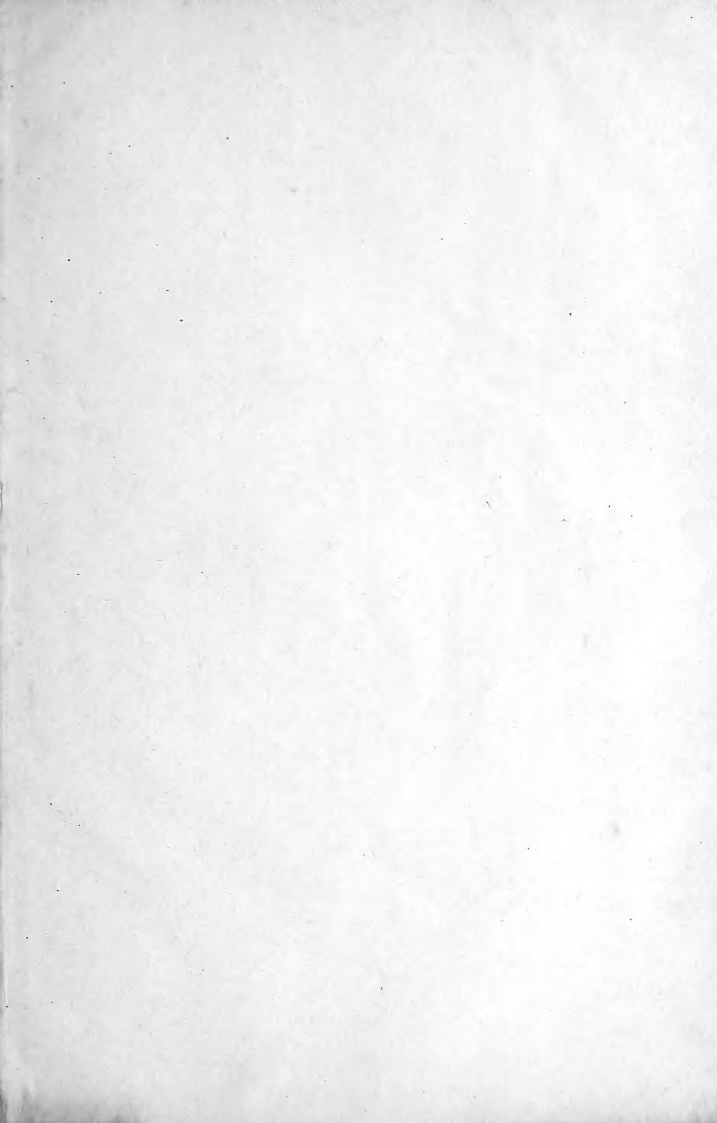
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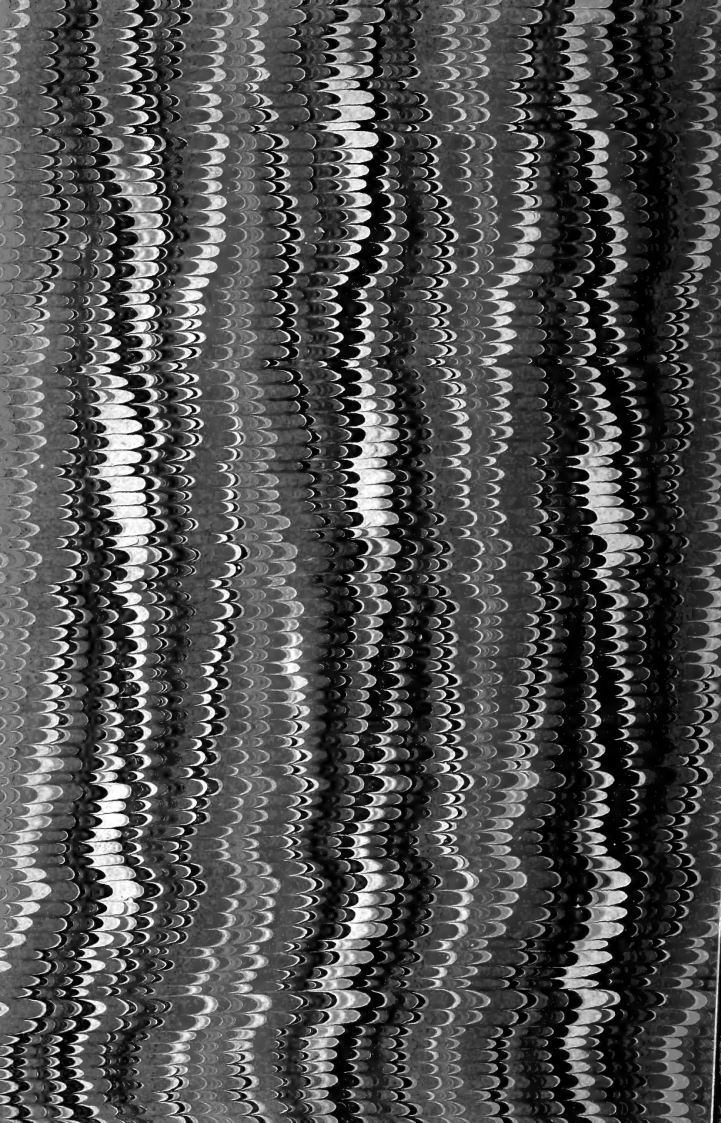
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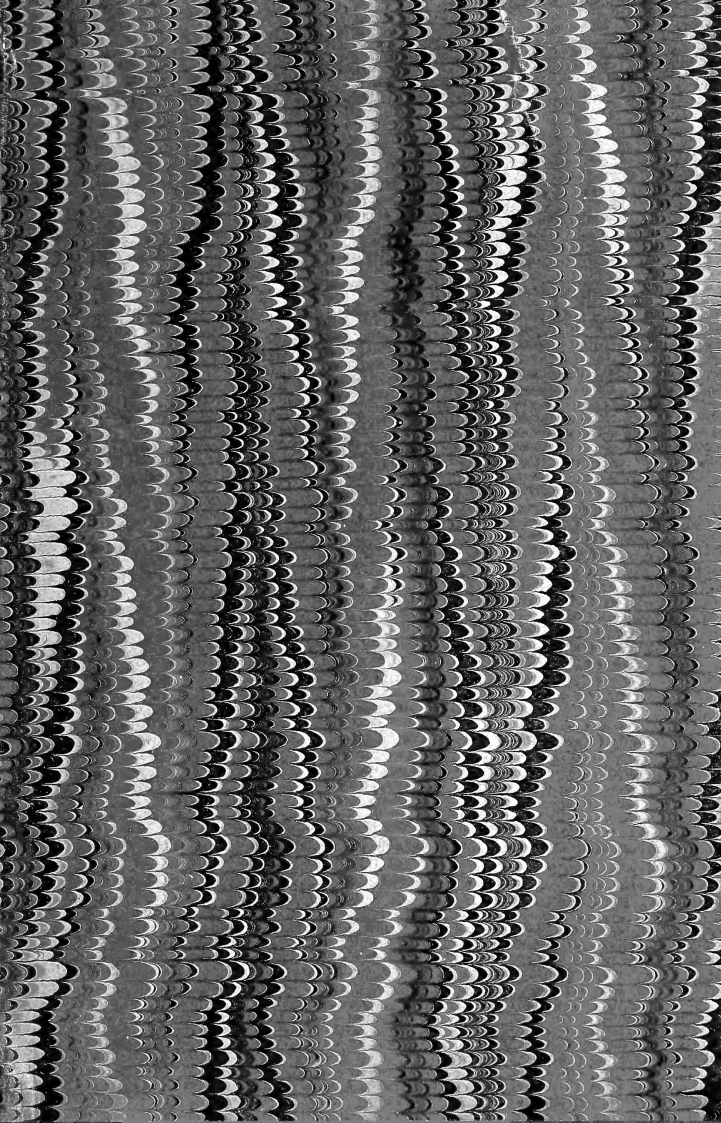












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